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# COUNTY HEALTH WORK NUMBER



## The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

This Bulletin will be sent free to any citizen of the State upon request.

Vol. XXXV

JANUARY, 1920

No. 1



CONFERENCE OF COUNTY HEALTH OFFICERS, DECEMBER, 1919



GROUP OF COUNTY HEALTH OFFICERS IN CONFERENCE WITH THE STATE  
HEALTH OFFICER, JANUARY, 1919

### FOREWORD

This issue of the HEALTH BULLETIN contains a review of coöperative county health work in North Carolina and of the ways by which results have been attained in improving the health and sanitary conditions of our homes. The results thus far are very gratifying and the State Board of Health aims to enlarge the service of its Bureau of County Health Work so that it may assist any county which may desire this service, whether it be a single unit, a public health nurse, a whole-time health officer, or a coöperative health department.

Dr. K. E. Miller, of the United States Public Health Service, will be the Director of the Bureau of County Health Work during 1920. Dr. Miller has had a wide service in rural health and sanitary work in this and other states, and any county desiring information regarding public health work should communicate with him.

With the exception of two articles prepared by Dr. K. E. Miller, the material in this issue of the BULLETIN was prepared by Dr. B. E. Washburn, Director of the Bureau of County Health Work from July 1, 1917, to December 31, 1919.

# THE Health Bulletin



PUBLISHED BY THE NORTH CAROLINA STATE BOARD OF HEALTH

Vol. XXXV

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No. 1

## THE NEW PUBLIC HEALTH

The conceptions of health held by our ancestors, and still held by many people, have undergone revolution during the past twenty years. Before the facts regarding contagious diseases were learned, the causes and sources of these diseases were unknown. Many thought that the acute infectious diseases were inevitable and that the only thing to be done was to try and get well after you became sick. Not knowing the causes for these infections, the sources were sought in the surroundings of man; in such things as the air, the water, the climate, and the rise and fall of ground-waters. Tuberculosis was considered hereditary and non-infectious. The "catching" diseases were thought to originate in the slums and in the homes of the poor; and when they invaded the home of a well-to-do, a leak in the plumbing accounted for diphtheria, rotten potatoes in some part of the house for typhoid, or malaria was thought to be due to dampness or exposure to the night air.

A great change has taken place as a result of scientific investigation; we now know that the infectious diseases are caused by germs and that their source is not in man's surroundings but in man himself. The old public health was concerned with the environment; the new is concerned with the individual. But the public as a whole has not been taught the principles of disease prevention through control of infected individuals and does not appreciate the health relation existing between the individual and the community; the public does not recognize that a person infected with disease germs is, unless proper precautions are observed, a menace to his neighbors. The general public still holds to the ideas of a previous generation and believes the theories that have long been discarded in scientific circles.

The problem of public health is to educate the people regarding disease prevention and health conservation; and this education must be conducted in such a way as to cause our homes to apply sanitation and hygiene and receive benefits. From the very nature of the infectious diseases this education must be definite and presented in such a way as to establish individual responsibility. Our State Board of Health is conducting its work from this standpoint and the results are gratifying. But the problem is very definite and it is manifestly impossible for the State to handle it alone; the smaller units of government, the counties, must provide health instruction for the people. Health problems have a local and a State-wide significance and can best be solved by coöperation between the State Board of Health and the County Board of Health. The county should provide public health work



for its citizens while the State should coördinate the work of the different counties in such a way as to increase county initiative and make the county work more effective.

The importance of the initial effort in cooperative county health work, as is described in this issue of the Bulletin, is realized when we reflect, first, that the larger part of our country's population is rural, and, second, that on the vitality and efficiency of the rural population depend the food supply and the cost of living—the first consideration of every citizen whether of the country or the city.

## PRESENT STATUS OF COUNTY HEALTH WORK IN NORTH CAROLINA

In the Seventeenth Biennial Report of the State Board of Health, for the years 1917-1918, Dr. W. S. Rankin, State Health Officer says: "The State Board of Health, by its educational activities, has fostered, strengthened, and directed an interest on the part of the counties in local health work so that today North Carolina has sixteen counties, embracing a total population of 687,634, or 28½ per cent of the population of the State, under whole-time county health officers. No State in the Union has developed its county health work to a like extent."

During 1919, six additional counties provided for whole-time health officers, making a total of twenty-two such counties in the State, comprising 38 per cent of the State's population. Of the twenty-two, fourteen have county health departments conducted in cooperation with the State Board of Health. These counties, with the names and addresses of their health officers follow:

Wilson (organized Sept. 1, 1916).....Dr. L. J. Smith, Wilson.  
 Nash (organized July 1, 1917).....Dr. G. W. Botts, Nashville.  
 Davidson (organized July 1, 1917)....Dr. E. F. Long, Lexington.  
 \*Northampton (organized Aug. 1, 1917) Dr. P. G. Parker, Jackson.  
 †Lenoir (organized Aug. 15, 1917)...Dr. T. F. Wickliffe, Kinston.  
 Pitt (organized Dec. 1, 1917).....Dr. P. J. Chester, Greenville.  
 ‡Robeson (organized Dec. 1, 1917)...Dr. E. R. Hardin, Lumberton.  
 §Rowan (organized Jan. 1, 1918).Dr. C. W. Armstrong, Salisbury.  
 Forsyth (organized Jan. 1, 1918).Dr. A. C. Bulla, Winston-Salem.  
 ¶Edgecombe (organized April 1, 1919).Dr. C. L. Outland, Tarboro.  
 Cumberland (org. July 1, 1919)...Dr. W. C. Verdery, Fayetteville.  
 Halifax (organized Sept. 1, 1919)....Dr. P. C. Carter, Weldon.  
 Surry (organized Sept. 1, 1919)...Dr. L. L. Williams, Mount Airy.  
 Granville (organized Sept. 1, 1919)....Dr. J. A. Morris, Oxford.

In addition to these fourteen, Bertie, Vance, Beaufort, Union, and Harnett counties have made appropriations and asked for coöperation from the State

\*Dr. F. M. Register, now State Epidemiologist, had charge of the coöperative department in Northampton County until August 31, 1918.

†Dr. J. S. Mitchener was health officer of Lenoir County until December 31, 1918.

‡Dr. W. A. McPhaul, at present health officer of Montgomery, Alabama, directed Robeson County Department until Sept. 30, 1919.

§Dr. A. J. Warren, now Assistant State Health Officer, was in charge of the Rowan County Department until April 30, 1919.

¶Coöperative County health work was begun in Edgecombe on Jan. 1, 1917, along experimental lines, the standard plan being adopted April 1, 1919.

Board of Health. As soon as these counties start their work fully 45 per cent of the entire population of the State will be served by effective local health organizations.

The following eight counties have whole-time health officers or health departments conducted independently and without any cooperation or co-ordination with the State Board of Health.

<i>County</i>	<i>Health Officer</i>
New Hanover.....	Dr. C. E. Low, Wilmington.
Sampson.....	Dr. E. R. Hollinsworth, Clinton.
Guilford.....	Dr. W. M. Jones, Greensboro.
Durham.....	Dr. Arch Cheatham, Durham.
Buncombe.....	Dr. W. H. Scruggs, Asheville.
Wake.....	Dr. Percy Ahrons, Raleigh.
Cabarrus.....	Dr. S. E. Buchanan, Concord.
Gaston.....	Dr. W. B. Hunter, Gastonia.

### DEVELOPMENT OF COUNTY HEALTH WORK IN NORTH CAROLINA

Intensive county health work in North Carolina began with the hookworm campaign of 1909 to 1914, conducted by the Rockefeller Sanitary Commission and the State Board of Health. This campaign was essentially of an educational nature and was carried on in 99 of the 100 counties in the State, Ashe being the only county which did not provide for the work. During the campaign every section of the State was visited, and the people were taught the essentials of disease prevention. Following this, the State Board of Health and the Rockefeller Sanitary Commission conducted a number of community demonstrations in the eastern and southern parts of the State. This community work was directed solely against hookworm disease and soil pollution; but the result was that it proved conclusively that as small a governing body as a county can deal effectively with its definite health problems and get results. In each of these communities house-to-house visits were made, and the people were instructed as to the best methods of disease prevention, special emphasis being placed upon soil pollution diseases.

The next step was taken by the counties and from 1913 to 1916 a number of them became interested in health preservation to the extent of each employing a whole-time county health officer. In order to do this the county provided the funds for the salary of the health officer and the county work was conducted locally and without any connection with the State Board of Health. Great good resulted in an educational way from the work of these whole-time county health officers, our vital statistics records showing a decreased death-rate in the counties due to this work. The whole-time county health officers were handicapped, however, by the fact that each county was an isolated unit and that no coördination existed between any of the counties or between the counties and the State Board of Health. Then, too, the health officer, in the majority of cases, was not provided with proper equipment or

assistance to conduct his most effective work. These things served to handicap and prevent the full development of the county health program.

In counties which did not provide whole-time health officers the people demanded other units than the hookworm and soil pollution work, and in response to this demand the State Board of Health organized and supplied to the counties a number of optional units of health work. These included chiefly typhoid vaccination campaigns, medical inspection of schools, life extension, quarantine units, and units against special diseases, such as malaria and pellagra. Any county, by supplying the funds, could arrange with the State Board of Health to have a director sent to the county for several months to conduct the desired unit of work.

From September 1916 to June 1917 the State Board of Health and the International Health Board coöperated with Wilson County in a county-wide Soil Pollution Campaign, directed by Dr. B. E. Washburn of the International Health Board. This campaign was followed by the organization of the Wilson County Health Department, the first of ten coöperative county health departments to be started. From January 1917 to March 1919 the State Board of Health and the United States Public Health Service coöperated with Edgecombe County in a unit of county work directed by Dr. K. E. Miller of the Public Health Service. On April 1, 1919, a coöperative county department was organized in Edgecombe to work under the direction of the Bureau of County Health Work.

By means of the work of the county health officers, the optional units conducted by the State Board of Health, and the activity of the Bureau of Education and Engineering of the State Board, the State had become educated to the point of having the General Assembly of 1917 enact laws requiring two prescribed units of health work for all the counties of the State. These were the quarantine unit and a school unit.

The General Assembly of 1919 revised the law requiring the medical inspection of school children and made it more effective, providing \$50,000 for the treatment of defective children. The enforcement of the school inspection law is placed under the direction of a Bureau of Medical Inspection of Schools of which Dr. G. M. Cooper is director. The personnel of this Bureau consists of from six to nine full-time dentists and six trained nurses. With this staff dental and throat clinics are being held in all parts of the State by a plan which will reach all the counties once every three years.

The General Assembly of 1919 also enacted a State-wide sanitary law requiring the installation of a sanitary privy at every home within fly-range (300 yards) of another home; together with means of inspection and provisions for enforcing maintenance.

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### THE PROBLEM OF COUNTY HEALTH IN NORTH CAROLINA

The general death-rate in North Carolina in 1917 (the last year for which we have a published report) was 14.1 per thousand, while the birth rate was 31.8 per thousand (52,812 white 23,727 colored). There were 33,989 deaths during the year (20,438 whites and 12,551 colored). An analysis of these deaths will show something of the health problems of the State. During 1917, 11,089 or more than 32 per cent of the total deaths, occurred



among children two years or age and under; 6,735 deaths were from diseases peculiar to adult life, such as cancer, diabetes, Bright's disease, apoplexy, and organic heart conditions; 3,402 deaths were from tuberculosis; 4,384 deaths were from soil pollution diseases; and 2,080 from the acute infectious diseases.

The majority of the people of North Carolina live in the country, 85 per cent of the population being rural. About one-third of the people are negroes, the greater part of whom live in the eastern section of the State. Agriculture is, naturally, the chief industry, the manufacture of cotton being second in importance. Less than a dozen of the towns of the State have more than 10,000 population, so the chief health problems are rural in nature; and the only successful plan of work is one designed to reach and educate rural people. Consideration must be given to the fact that the educational advantages of these people have been limited and that in some counties the majority of the people are negroes, many of whom are ignorant and superstitious.

The Federal Government by its own methods of examination applied to something like 10,000,000 men drawn from all walks of American life and from the healthiest age group—from 21 to 31 years of age—pronounced 38 per cent of those examined unfit for military service.

In North Carolina the explanation for this low ebb of vitality lies in the prevalence of the subacute, devitalizing, crippling diseases found in our rural sections. Among such diseases may be mentioned malaria, almost entirely rural and affecting 25 per cent of our people; hookworm disease also almost entirely rural and affecting about 30 per cent of the people; chronic constipation, affecting 20 per cent of the people; suppurating gums, affecting 30 to 40 per cent of the population; adenoids, tonsils, defective vision and bad teeth, all astoundingly prevalent and more frequently encountered among rural people than in the towns and cities.

The relative importance of these crippling diseases is not properly appreciated, since they rarely appear in the death list. They must, however, occupy an important place in any plan of health work, as they exercise a potent influence over the death rates indirectly through lowered vitality. Public health work is accordingly aimed not only at the lowering of death rates, but the increase of general efficiency.

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## PLAN OF COOPERATIVE COUNTY HEALTH WORK WITH A RECORD OF ACCOMPLISHMENTS

The General Assembly of 1917 also made an appropriation of \$15,000 for assisting county health work. The funds of the State were supplemented by the International Health Board and a Bureau of County Health Work was opened July 1, 1917. The object of the Bureau has been to demonstrate the best methods of conducting county health work, and at the same time demonstrate to a county that it (the county) is able to maintain an adequately equipped, full-time health department.

The Bureau of County Health Work, in order to accomplish its object, has since July 1917 coöperated with the following ten counties in a three-

year plan of public health work: Davidson, Forsyth, Halifax, Lenoir, Nash, Northampton, Pitt, Robeson, Rowan, and Wilson. The work in each county consists of definite units on the more important health problems rather than an attempt to cover the entire field of county health activity in a short period of time. The more important units of work are concerned with public health education; the prevention of soil pollution and its attending diseases, such as typhoid fever, infant diarrhea, the dysenteries, and hookworm; life extension work, which contemplates the early detection and prevention of the diseases of adult life; the medical inspection and treatment of school children; the quarantine of infectious diseases; the prevention of tuberculosis; and infant hygiene work. During the first year of each county health department, in addition to the educational work, three units of work were undertaken; the quarantine, the soil pollution, and the school units.

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### PUBLIC HEALTH EDUCATION

The policy of the North Carolina State Board of Health has been to conduct its activities from an educational standpoint. Its method has been to present the facts of modern medicine and sanitation in such a way that every citizen and every county may receive their benefits. In the county this educational work is conducted by the health department staff through lectures and demonstrations, newspaper articles, literature and special handbills, clinics, and consultations. Special attention has been given to the schools and a health catechism and other suitable literature has been prepared for the use of the pupils. In Northampton and Lenoir counties a health organization was perfected at each school to look after the health and sanitation of the school district and make reports to the health officer.

Coöperation has been received from the business men through the use of their advertising space in the local newspapers to make announcements regarding the work of the county department; the method being similar to that used during the war to advertise Liberty Loan Drives. In Wilson County, for example, the health officer personally visited each advertiser and explained the purpose of this coöperative plan of advertising; each man was asked to insert one or more of a list of health "Axioms" as part of his advertisement and not a single firm failed to assist. The following will illustrate the character of the advertisements:

# We Believe That Typhoid Fever

Is an unnecessary disease. Protect yourself by Vaccination and Sanitation.

Vaccination protects you against Typhoid Fever.

Sanitation removes the cause of Typhoid Fever.

Be Vaccinated against Typhoid Fever.

Sanitate your Homes. This will stop Typhoid Fever. DO IT NOW!

## WILSON DRUG COMPANY THE SERVICE STORE

Table No. 1 shows the manner in which the people have been reached through the educational work.

TABLE No. 1.

### RECORD OF PUBLIC HEALTH EDUCATIONAL WORK

County	Date of Organization	Number of Public Meetings with Attendance						Articles Published in Newspapers		
		1917		1918		To Nov. 30 1919		1917	1918	To Nov. 30 1919
Wilson.....	July 1, 1917	5	630	51	2,838	51	2,364	22	123	89
Davidson.....	July 1, 1917	64	6,891	129	12,881	122	19,103	21	63	104
Nash.....	July 1, 1917	26	2,339	46	5,811	81	5,073	29	50	3
Northampton.....	Aug. 1, 1917	37	5,100	117	13,415	33	2,275	37	111	127
Lenoir.....	Aug. 15, 1917	37	2,791	137	6,051	140	9,328	31	162	150
Pitt.....	Dec. 1, 1917	1	75	38	3,842	55	5,336	14	92	160
Robeson.....	Dec. 1, 1917	11	1,110	99	9,676	89	13,211	7	127	92
Rowan.....	Jan. 1, 1918			97	8,221	100	12,961		36	83
Forsyth.....	Jan. 1, 1918			70	7,004	57	11,023		129	184
Halifax.....	Sept. 1, 1919					7	535			38
Totals.....		181	18,936	784	69,739	735	81,209	161	893	1,030

## THE QUARANTINE UNIT

The quarantine unit is the enforcement of the State quarantine law and, aside from the educational work, is largely clerical and can be done by the office assistant. This unit, of course, is continued throughout the entire three years. The conduct of the quarantine unit is largely educational and has for its object the prevention of the spread of the acute infectious diseases. Monthly articles on the quarantine work of the county are submitted to the newspapers, as are also the names and addresses of each case reported. Diseases are required to be reported by the attending physician or by the householder. The health officer visits as many cases as possible in order to give personal instructions as to the prevention of the spread of the disease. When reports of contagious diseases are received literature on each particular disease is sent to the householder and to the teacher of the school in the district where the home is located, if the school is in session. A record of each case reported is kept at the county health office and the report is then sent to the State Board of Health. The health officer is required to make detailed monthly reports to the State Epidemiologist. The number of cases quarantined and visited is shown in Table No. 2.

TABLE No. 2.  
REPORT OF QUARANTINE UNIT

County	Number of Cases Quarantined		Cases Visited by Health Officer	
	1918	To Nov. 30, 1919	1918	1919
Wilson.....	389	135	23	27
Davidson.....	564	258	73	29
Nash.....	507	114	13	46
Northampton.....	161	103	26	68
Lenoir.....	314	345	143	124
Pitt.....	379	772	4	173
Robeson.....	464	210	14	-----
Rowan.....	949	306	212	86
Forsyth.....	709	822	84	286
Halifax.....	-----	158	-----	23
Totals.....	4,436	3,226	592	842

## THE SCHOOL UNIT

The school unit takes up the greater part of the second six months of the first year's work and is continued through the remainder of the three years. The object of this unit is to obtain a record of the physical condition of every school child in each county and to get as many as possible of the defective children treated. A standard individual case card has been adopted, suitable for filing, and when filled out contains a full history of the child,



such as date of birth, age entering school, grades repeated if any, family disease history, height, weight, chest expansion, condition of teeth, eyes, ears, throat, and nutrition. The information for this card is procured by the teacher and the completed cards are transmitted to the health officer, who carefully considers each case. Each child found, from examination of his card, to be abnormal is given a complete examination by the health officer. This examination is made, whenever possible, in the presence of the parents so that the necessity of treatment can be presented in a personal manner.

The budgets of each county department provide \$500 per year for the treatment of defective children. During 1918 an effort was made to educate the parents regarding the dangers of dental defects and impress the importance of having such defects treated. In order to accomplish this the Bureau of County Health Work coöperated with the Bureau of Medical Inspection of Schools in providing free traveling dental service for the rural school children. The success of these dental clinics was due to the efforts of Dr. G. M. Cooper, Director of the Bureau of Medical Inspection of Schools. In conducting the clinics, six dentists were employed and each provided with a portable dental outfit which could be set up in a schoolhouse or elsewhere, ready for a patient, in fifteen minutes.

During 1918, 197 dispensaries and 80 lectures on oral hygiene were held in seven counties and 5,759 children received free treatment. During 1919, 93 dispensaries have been held in six counties at which 3,751 children have received treatment. Nine-tenths of the patients were very young children whom most dentists do not like to treat; and at least 90 per cent of them had never visited a dentist before. At practically every dispensary point the health officer accompanied and assisted the dentist and while the dentist was busy with the children's teeth the health officer administered typhoid vaccine, made examinations, and gave treatments for hookworm.

In addition to the dental work the children were treated, by operation, for adenoids and diseased tonsils, part of this work being done through what are called "Adenoid and Tonsil Clubs." In such clubs the services of a first-class operator assisted by a trained nurse are secured. With an operating outfit this specialist visits a school where an emergency hospital has been organized and performs, on an average, from sixteen to twenty operations in a day, being assisted by a local doctor who acts as anesthetist. The cost of the special service for such a day's work is about \$150, and this amount is paid by the parents or friends of the children; the remainder, including supplies, equipment, and administration, is borne by the State Board of Health. At least one-fourth of the operations have been performed on children whose parents were unable to pay for this special work. In addition to this plan, a number of public-spirited specialists gave reduced rates to school children coming to their offices for treatment. Mention should be made of the specialist at Salisbury who not only gave reduced rates to school children, but also operated on children of indigent parents without charge. By these methods 1174 school children in the ten counties have been operated upon for diseased tonsils and enlarged adenoids.

Table No. 3 gives the details of the school work.

TABLE No. 3  
REPORT OF SCHOOL UNIT

County	Date of Organization	1917			1918			1919		
		Schools Visited	Children Examined	Defects Treated	Schools Visited	Children Examined	Defects Treated	Schools Visited	Children Examined	Defects Treated
Wilson.....	July 1, 1917	8	138	-----	76	2,020	973	33	1,579	22
Davidson.....	July 1, 1917	27	11	23	30	1,681	1,157	49	640	48
Nash.....	July 1, 1917	10	-----	-----	83	449	665	87	78	10
Northampton.....	Aug. 1, 1917	23	200	-----	122	1,666	571	61	388	432
Lenoir.....	Aug. 15, 1917	100	394	-----	4	154	459	68	1,126	469
Pitt.....	Dec. 1, 1917	-----	-----	-----	20	818	145	72	1,368	768
Robeson.....	Dec. 1, 1917	-----	-----	-----	63	2,127	1,602	37	1,228	1
Rowan.....	Jan. 1, 1918	-----	-----	-----	44	1,221	126	14	1,052	905
Forsyth.....	Jan. 1, 1918	-----	-----	-----	63	2,702	774	51	664	1,837
Halifax.....	Sept. 1, 1919	-----	-----	-----	-----	-----	-----	40	61	-----
Totals.....		168	743	23	510	12,838	6,472	517	8,184	3,751

### SOIL POLLUTION UNIT

On October 1, 1919 the enforcement of the State-wide sanitary privy law began. Since this time the soil pollution assistant has limited his work to rural districts assisting, of course, the State inspectors in their work among the towns. In order to facilitate the work of this assistant Northampton, Nash, Wilson, Robeson, Forsyth, and Rowan counties, through their boards of health, enacted ordinances requiring sanitary closets at every home. A majority of the towns and villages in the ten counties have passed suitable sanitary privy ordinances. The towns of Greenville, Salisbury, Wilson, Lumberton, Lexington, and Thomasville, have each provided special sanitary inspectors to work under the direction of the health officer.

The success of improving home sanitation is shown by the number of homes building sanitary privies, as is given in detail in the following table:

TABLE No. 4.  
REPORT OF HOME SANITATION

County	Date of Organization	Number Homes Building Sanitary Privies		
		1917	1918	1919
Wilson.....	July 1, 1917	*2,137	51	392
Davidson.....	July 1, 1917	246	1,368	174
Nash.....	July 1, 1917	380	367	59
Northampton.....	Aug. 1, 1917	834	593	377
Lenoir.....	Aug. 15, 1917	202	829	497
Pitt.....	Dec. 1, 1917	-----	178	379
Robeson.....	Dec. 1, 1917	-----	956	853
Rowan.....	Jan. 1, 1918	-----	1,615	496
Forsyth.....	Jan 1, 1918	-----	523	1,284
Totals.....		3,799	6,480	4,511

\*Prior to the organization of the Wilson County Health Department, a soil pollution campaign was conducted in the county under the direction of Dr. B. E. Washburn, the State Board of Health and the International Health Board cooperating. This campaign took the place of the first six months of the health department; and the number of privies built during the campaign is included in the 1917 statistics.

Making examinations for hookworms and treating those found to be infected is an important part of the soil pollution unit. Because of the difficulty in visiting homes in country districts it has been hard to secure specimens for re-examination after treatment; and also the patient, as a rule, upon receiving relief following the first treatment, seldom cares to go to the trouble of a second examination to find out if he has been cured. Table No. 5 shows the number of examinations and the number found infected.

TABLE No. 5.

## RECORD OF HOOKWORM WORK

County	Date of Organization	1917		1918		1919	
		Number Examined	Number Infected	Number Examined	Number Infected	Number Examined	Number Infected
Wilson.....	July 1, 1917	*9,048	2,050	96	30	2,323	59
Davidson.....	July 1, 1917	4,177	197	465	14	396	2
Nash.....	July 1, 1917	1,344	150	243	43	39	12
Northampton.....	Aug. 1, 1917	1,240	648	1,305	327	32	20
Lenoir.....	Aug. 15, 1917	1,663	475	2,656	1,186	284	116
Pitt.....	Dec. 1, 1917	-----	-----	628	168	208	63
Robeson.....	Dec. 1, 1917	-----	-----	62	30	153	88
Forsyth.....	Jan. 1, 1918	-----	-----	2,555	100	815	65
Rowan.....	Jan. 1, 1918	-----	-----	1,848	87	359	8
Totals.....	-----	17,472	3,520	9,858	1,985	3,909	333

\*These specimens were examined during the Wilson County Soil Pollution Campaign, September 1916 to March 1917. See Page 12, Foot Note.

In the work of sanitation an effort has been made in every instance, to create a privy sense, through educating the people regarding soil pollution diseases, rather than merely to build privies. When a family is taught the necessity of a sanitary privy, the privy will be built. To build a privy without educating the people of the need of preventing soil pollution is useless. You can build a privy at almost any home; but a mere privy house does not insure against soil pollution—the privy must be used to be effective. When a family goes to the expense of building a privy it is an absolute indication that they realize the importance of soil pollution prevention. For these important reasons the privies reported were built entirely by the householders and never by a representative of the county departments.

The majority of the privies are of the pit type, though the policy has been to consider each family a law unto itself and advocate the type considered by the health officer as best suited for the needs of each individual family. In building pit privies particular care was exercised to have each privy built according to a standard type and to refuse to approve any building not substantially and correctly built.

In preventing typhoid fever, special vaccination campaigns are conducted during the summers. During 1918, lipo-vaccine obtained from the War Department was used with excellent results. This greatly facilitated the work of vaccination as only one dose was required for immunization. During these summer campaigns vaccinations are also given for smallpox. The number of persons vaccinated against typhoid fever and smallpox is shown in Table No. 6.

TABLE No. 6.  
RECORD OF TYPHOID AND SMALLPOX VACCINATIONS

County	Date of Organization	1917		1918		1919	
		Typhoid	Small-pox	Typhoid	Small-pox	Typhoid	Small-pox
Wilson.....	July 1, 1917	1,605	-----	2,401	2,246	2,283	147
Davidson.....	July 1, 1917	914	1,138	796	58	3,367	124
Nash.....	July 1, 1917	597	93	896	79	385	982
Northampton.....	Aug. 1, 1917	5,272	63	5,898	700	2,685	436
Lenoir.....	Aug. 15, 1917	2,113	1	7,065	328	3,051	593
Pitt.....	Dec. 1, 1917	-----	286	3,226	595	2,685	530
Robeson.....	Dec. 1, 1917	-----	-----	2,634	583	2,824	25
Rowan.....	Jan. 1, 1918	-----	-----	4,665	272	4,409	204
Forsyth.....	Jan. 1, 1918	-----	-----	758	109	1,473	264
Halifax.....	Sept. 1, 1919	-----	-----	-----	-----	9	435
Totals.....	-----	10,501	1,581	35,139	4,970	23,171	3,767

### THE LIFE EXTENSION UNIT

The life extension unit begins in the second year of each county health department and consists of making thorough physical examinations of adults. This work is designed for people who are well rather than for those who are sick and its object is to show the necessity for periodic medical examinations if bodily vigor and mental efficiency are to be maintained at their highest. The purpose of the examination is to detect latent impairments to health, to find minor defects which may injure the citizen and decrease his working capacity, and to urge medical attention before the condition may become serious or permanent. The examinations are made in the health office and include urine and blood pressure tests; but in no case is treatment given. Where medical or surgical attention is thought necessary the patient chooses his own physician. Twelve to fifteen examinations are made each day; and in order to facilitate the work each applicant brings with him a filled history blank. Each person examined is given a report, with verbal and printed advice, together with suitable literature on health conditions in which he should be interested.

Before beginning the life extension work each health officer spends from ten days to two weeks at the Sanatorium for Tuberculosis where he is given a postgraduate course in physical diagnosis. With the coöperation of the Sanatorium definite work is conducted in each county against tuberculosis. Lectures and demonstrations are given and physical examinations



are made of persons who are suspected of having the disease. This is done as part of the life extension unit, the medical staff of the Sanatorium acting as consultants to the county health officers.

The life extension unit has proved very popular; in most instances the more educated class taking advantage of it and, for this reason, it has proved of great benefit in securing the interest and coöperation of influential citizens.

Life extension examinations have been made as follows:

TABLE NO. 7.  
RECORD OF LIFE EXTENSION WORK

County	Date of Organization	Number of Examinations Made		
		1917	1918	1919
Wilson.....	July 1, 1917	209	161	127
Davidson.....	July 1, 1917	147	2	862
Nash.....	July 1, 1917			234
Northampton.....	Aug. 1, 1917		5	233
Lenoir.....	Aug. 15, 1917	175	16	67
Pitt.....	Dec. 1, 1917			383
Robeson.....	Dec. 1, 1917	208	791	224
Rowan.....	Jan. 1, 1918			591
Forsyth.....	Jan. 1, 1918			278
Halifax.....	Sept. 1, 1919			14
Totals.....		739	975	3,013

The results of the examinations are seen in the following findings from the Davidson County work:

RESULTS OF LIFE EXTENSION EXAMINATIONS  
Number of Examinations Made, 193

Defects	Number	Percentage	Defects	Number	Percentage
Nutrition.....	24	12.3	Heart.....	31	16.
Overweight.....	19	9.2	Lungs.....	22	11.4
Underweight.....	28	14.5	Abdomen.....	10	5.2
Posture and physique.....	13	6.7	Mammary glands.....		
Vision (uncorrected).....	91	47.	Lymphatic glands.....	2	1.
Ears.....	51	31.7	Rupture.....	10	5.2
Pulse.....	27	14.	Genito-urinary.....	10	5.2
Arteries.....	11	5.7	Venereal.....	4	2.
Thyroid gland.....	10	5.2	Upper limbs.....	1	.5
Nervous system.....	25	13.4	Lower limbs.....	5	2.6
Nose and throat.....	71	36.8	Arches of feet.....	54	27.9
Mouth and tongue.....	2	1.	Skin.....	17	8.9
Teeth and gums.....	133	69.	New growth.....	3	1.5
Sinuses.....	16	8.3	Errors in diet.....	16	8.3
Blood Pressure.....	51	32.7	Blood.....	3	1.5
Albumen.....	10	5.2	Sputum.....	3	1.5
Hygienic errors.....	31	16.	Glucose.....	3	1.5

### THE INFANT HYGIENE UNIT

The Infant Hygiene Unit is added at the beginning of the third year and has for its purpose the lowering of the death-rate among babies and young children by educating the mothers as to the best means of caring for their young. The unit is conducted by a nurse who gets in touch with and secures the coöperation of physicians, ministers, teachers, demonstration agents, club women, and others who can assist her in reaching the mothers of the county. Wherever possible, a rest room is established for the use of the country women and children and for a clinic.

The work of the nurse consists of:

1. The instruction of mothers in the hygiene of pregnancy, infancy, and childhood, through lectures, demonstrations, and personal visits.
2. The supervision and instruction of midwives.
3. Conducting a clinic at the health office and other places in the county.
4. Conducting an intensive study course for clubs and women's organizations concluding with a clinic conducted by the health officer. The study course consists of eight daily periods, the subject of study for each period being as follows:
  - a. Conditions necessary for general health. Sanitation, ventilation, proper food, regular habits, coöperation with the health officer in preventive measures and medical attention.
  - b. Hygiene of pregnancy.
  - c. Confinement.
  - d. Care of the newborn baby, and care of the mother.
  - e. Necessity for maternal nursing.
  - f. The bottle-fed baby. The preparation of artificial food.
  - g. Weaning. The child of pre-school age.
  - h. A clinic, conducted by the health officer, for the examination of children.

Literature for the study course is provided by the State Board of Health. After the intensive course is completed the nurse arranges to meet with the club once a month for the discussion of community health conditions and for consultation by mothers.

In addition to the club work, the nurse makes an effort to get in touch with all expectant mothers, mothers of bottle-fed babies and of babies with diarrhea, and with homes where tuberculosis exists, and give personal instruction in the proper care of these conditions. A tack map is kept showing the location and the nature of the assistance given by the nurse.

An important feature of the infant hygiene unit is the control of the practice of midwifery, through an ordinance of the county board of health requiring each midwife to qualify before and secure a permit from the health officer.

Infant hygiene work has been conducted in Lenoir, Wilson, and Northampton counties and is being begun in Forsyth and Davidson. The county nurses have worked in coöperation with the Bureau of Infant Hygiene of the State Board of Health and under the direction of Mrs. Kate Brew Vaughn. The outline of work as well as the literature used in the unit were prepared by Mrs. Vaughn.

## ADMINISTRATION OF THE COOPERATIVE COUNTY HEALTH DEPARTMENTS

Each county department is directed by a health officer who is appointed by the State Board of Health, with the approval of the county board of health, and is an official of the State Board of Health. The health officer is given an adequate corps of assistants to enable him to give as near as possible each unit of work to his entire county. An office assistant is provided for the entire three years of work. During the intensive soil pollution campaign from three to five assistants are provided for the field work. After the first six months, a field worker for follow-up work is employed for the remainder of the three years. In the medical inspection of schools the health officer is assisted by a dentist.

As has already been stated, each county health department is organized on a three-year plan and is under the joint control of the State and county boards of health. The State Board of Health and the International Health Board assist by suggesting the best methods of conducting the county department and also financially by providing (each contributing an equal portion) 50 per cent of the budget of each county health department during the first year, 40 per cent the second year, and 25 per cent the third year. The budgets for the county health departments are as follows.

	<i>First Year</i>	<i>Second Year</i>	<i>Third Year</i>
Health officer, salary.....	\$2,100	\$2,100	\$2,400
Traveling of health officer.....	600	600	750
Clerical assistant, salary.....	600	600	900
Fixtures and supplies.....	500	100	100
Contingent fund.....	140	140	140
Soil pollution unit.....	2,420	900	900
Quarantine and disinfection.....	100	100	100
School work unit.....	500	500	500
Life extension unit.....	-----	400	-----
Infant hygiene unit.....	-----	-----	100
Totals.....	\$6,970	\$5,440	\$5,890

The State Board of Health through the Bureau of County Health Work coördinates and standardizes the work of the county departments. Each health officer conducts the same plan of work, makes weekly and monthly reports to the State Bureau on a regular form, and is supplied with reports from the other nine counties. From these reports he can keep in touch with the accomplishments of other health officers engaged in work similar to his own. Reports of the work in all the counties are sent monthly to the Board of County Commissioners of each coöperating county so that they may compare the work of their department with that being done elsewhere. The Director of the Bureau of County Health Work through letters, conferences, and personal visits is able to assist the health officers and keep them advised regarding methods being used in other counties. The State Board of Health in its coöperative policy requires a standard plan of county work and a means of comparing the work of the various counties, but always leaves the details of conducting each unit to the initiative of the health officer.

## RESULTS OF COOPERATIVE COUNTY HEALTH WORK

Up to November 30, 1919, the work in the ten coöperative counties had been conducted for an aggregate of 230 months and, in spite of the handicaps caused by the war and the epidemic of influenza, had been successful and produced definite results toward bettering health and sanitary conditions. The following statement shows the average month's work of the average health department in the average of the ten counties:

1. No. of public meetings held.....	8
Attendance .....	739
2. No. of articles published in county papers.....	9
3. No. of sanitary closets built .....	64
4. No. of hookworm specimens examined.....	136
5. No. of contagious diseases quarantined.....	34
6. No. of schools visited .....	6
7. No. of children examined .....	95
8. No. of children treated for defects.....	52
9. No. of life extension examinations .....	20
10. No. of people vaccinated against typhoid.....	299
11. No. of people vaccinated against smallpox.....	45

Among the results of the coöperative plan of work, the four most striking are probably the increase in the number of counties providing whole-time health officers or health departments, the new and progressive health legislation enacted by the General Assembly of 1919, the decrease in the death-rate from the soil pollution diseases, and the recognition of the value of county health work by officials, business men, and the people in general.

1. At the time of the organization of the Bureau of County Health Work, July 1, 1917, Wilson and Edgecombe were the only two counties coöperating with the State Board of Health and the work of these counties was experimental in nature. On November 30, 1919, in addition to the ten counties included in the coöperative plan of work, four additional counties were conducting health departments under the direction of the Bureau of County Health Work, five other counties had made appropriations and asked for coöperation, and two counties (Gaston and Cabarrus) had supplied whole-time health officers independent of outside aid. The Edgecombe County Department was organized on April 1, 1919, receiving assistance from the State Board of Health and the United States Public Health Service. The Cumberland County Department opened July 1, 1919, also receives aid from the State Board of Health and the United States Public Health Service. The counties of Granville and Surry receive coöperation from the State Board of Health. Vance, Beaufort, Bertie, Union, and Harnett counties have made appropriations for coöperative work but have not yet been organized.

2. As a result of the educational health work done by all the Bureaus of the State Board of Health, together with the demonstrations in the coöperating counties, the General Assembly of 1919 enacted a State-wide law requiring the construction and maintenance of a sanitary privy at every home within fly-range (300 yards) of another home. Provision is made for enforcing this law and also for the regular inspection of the privies from two to six times per year. The school medical inspection law was



amended and an appropriation of \$50,000 made for the treatment of defective children. The appropriation for county health work was increased from \$15,000 to \$27,500 per year.

3. There has been a marked decrease in the death-rate from the soil pollution diseases. The prevalence of typhoid fever is usually considered a fair index of the incidence of soil pollution diseases; and a reduction in the death-rate from typhoid fever is an indication of a reduction in the number of cases and deaths of all diseases which are spread through pollution of the soil. In North Carolina we have statistics of typhoid fever since 1914. The following tables give the average number of deaths from the disease, together with the average death-rate, in each of the counties for the period 1914-1917; and, also, give the same statistics for 1918. A study of these tables will show the most important result of work to prevent the spread of soil pollution. By considering the cost of a case of typhoid fever (Rosenau places the average cost of a case at \$400.00), and remembering that there are at least ten cases to every death, an estimate may be made of the financial saving to the counties from this single phase of the health department work.

DEATHS FROM TYPHOID FEVER DURING THE YEARS 1914, 1915, 1916, AND 1917  
(Death Rates per 100,000 Shown by Counties)

County	Total Deaths for 4-Year Period	Yearly Average of Deaths	Death Rate for Average Year
Davidson.....	44	11	33.7
Forsyth.....	82	20½	37.7
Lenoir.....	53	13¼	52.9
Nash.....	42	10½	27.
Northampton.....	14	3½	15.2
Pitt.....	63	15¾	40.1
Robeson.....	66	16½	30.2
Rowan.....	57	14¼	34.7
Wilson.....	57	14¼	46.1
Totals.....	478	119½	35.3

DEATHS FROM TYPHOID DURING 1918

County	Population	No. Deaths	Death Rate
Davidson.....	33,171	None	None
Forsyth.....	23,732	4	16.
Lenoir.....	25,365	2	7.8
Nash.....	32,913	1	3.
Northampton.....	23,061	None	None
Pitt.....	39,760	2	5.
Robeson.....	54,223	5	9.2
Rowan.....	41,575	4	9.6
Wilson.....	31,207	6	19.2
Totals.....	305,016	24	7.8

From January 1 to November 30, 1919, there had been only 340 cases of typhoid in the coöperating counties and the death-rate from the disease will probably be as low as it was for 1918. In the town of Salisbury, Rowan County, for example, there were 43 cases of typhoid during 1918, while only two cases had been reported during 1919, the reduction undoubtedly being due to the fact that during 1918 a sanitary pit privy was built at every home not connected with the sewer.

A comparison of the hookworm examinations of the present work with those of the campaign of 1911-1914 shows a reduction in the percentage of infection. This is shown in table No. 8.

TABLE NO. 8  
REPORT OF EXAMINATIONS FOR HOOKWORMS

County	CAMPAIGN OF 1911-1914				HEALTH DEPARTMENT WORK 1917-1919		
	Date	Number Examined	Number Infected	Per Cent Infection	Number Examined	Number Infected	Per Cent Infection
Wilson.....	1912	3,716	1,710	46	11,467	2,139	19
Davidson.....	1914	7,577	1,230	16	5,038	213	4
Nash.....	1912	3,308	1,777	54	1,626	205	13
Northampton.....	1911	6,443	2,197	34	2,577	995	39
Lenoir.....	1912	1,466	590	40	4,603	1,777	38
Pitt.....	1911	4,526	2,390	51	836	231	28
Robeson.....	1911	3,263	1,973	60	215	118	55
Rowan.....	1913	3,794	310	8	2,207	95	4
Forsyth.....	1913	2,757	585	21	3,370	165	5
Totals.....		36,850	12,762	35	31,939	5,938	19

4. There have been many evidences of recognition on the part of the people of the importance of county health work and in every instance the coöperation of the leading citizens was pronounced. These evidences of recognition and coöperation were shown in numerous ways. The commissioners of seven of the counties voluntarily increased the salary of the health officer in addition to the budget item for salary. One board presented the health officer with \$100 in recognition of the value of the health work to the county.

In five counties the capital towns have provided funds for the employment of special sanitary inspectors to work under the direction of the health departments in eradicating soil pollution diseases. In recognition of the value of sanitary privies six county boards of health have enacted ordinances requiring every home in the county to be provided with a privy of a type approved by the health officer.

Aside from these material evidences of recognition from governing boards, a number of occurrences point to the fact that people are beginning to realize that good health is a financial asset.

The Bank of Grifton, in Pitt County, has adopted the policy of making loans only to persons who are able to present evidence that they live amid

sanitary surroundings. An applicant for a loan, in order to receive credit, must live in a home provided with a sanitary privy. He and his family must have been vaccinated against typhoid fever and be free from marked evidences of hookworm disease. The bank's point of view regarding public health was expressed by the cashier as "not sentiment but sound banking precautions." The banks in the town of Wilson (four in number) and the tobacco warehouse owners in making loans inquire if the home is provided with a sanitary privy.

The Colored Farmers' Agricultural Society of Northampton County, at its 1918 meeting, unanimously passed the following resolution:

"Believing that good health is the greatest asset the members of any association can have, and believing that keeping ourselves and our families well is largely in our own hands, then be it

"Resolved, that every member of the Northampton County Colored Agricultural Society pledges himself or herself—

1. "To have a sanitary toilet.
2. "To have all windows and doors screened against flies and mosquitoes.
3. "To look carefully after having pure drinking water.
4. "To see that the births of all children are duly registered."

It is gratifying to know that the medical profession endorses the work of the county health departments. The State Board of Health has recently received letters from a number of our leading physicians in which they have expressed their interest in the health work and have offered their coöperation. The following are examples of these and are from doctors living in Wilson and Lenoir counties:

"It has been very gratifying to watch the marked progress of the health work since I have been practicing medicine here in Wilson County.

"In 1913 when I first came here I was shocked by the prevalence of typhoid fever. I treated forty-seven cases that year and fifty-two the following year (1914); in 1915 forty-three cases. During the summer of 1915 the State and County Boards of Health jointly put on a vaccination campaign, 1916 the reduction was very marked, only had 18 cases, 1917, 12 cases, 1918, 8 cases, and 1919 this year only 5 cases.

"I consider this great reduction due to vaccination, education through health propoganda, and improved sanitary conditions generally.

"The country people in our locality have been thoroughly convinced of the importance of "drilled wells"; sanitary privies, and screened homes.

"I would not fail to mention the wonderful good accomplished in the hookworm work and life extension work done by the health department of our county.

"I am thoroughly convinced that it is the greatest work being conducted for the benefit of all the people in the county."

The second letter reads:

"Under separate cover I am mailing you a copy of yesterday afternoon's local paper showing our health officer's report to the County Commissioners. In some respects the results of health work in this county are, I believe, the most remarkable in this country. My records show (I can give histories) 113 cases of typhoid in this community when I began practice in the year 1899. Of course the older doctors had as many. With an increase (many fold) in population the health department has reduced the number to almost nothing in a comparative way. Very clearly the health department saved this county alone on the typhoid item \$120,931—to say nothing of the other preventable diseases. Has it paid us? If it was commercial stock

that was paying this way people would fall over each other to buy it. Now this estimate is based on finances. What of the anguish and suffering it has prevented?

"You will remember that we were the first North Carolina county to get in under the coöperative plan of work. Now let me see you prize us out! You can't get this county "prized out" of health work, now that the people understand it, with a jack screw. Lenoir County has been running ahead ever since we gave the State its first Constitutional Governor. Small wonder that we have put it over the other counties in health work. Furthermore, we are not yet through. Did you notice we put in two million dollars for good roads? Well, we are going to pay for them with the health department."

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## RESPONSIBILITY FOR COUNTY HEALTH WORK

By DR. K. E. MILLER, United States Public Health Service, Director of Bureau of County Health Work for 1920.

One can not view those counties which have equipped themselves with splendid health machinery without a sudden flush of envy. I who am separated from such blessings only by a county line can not help asking some pointed questions. Why does no one come to me or my community to explain the causes of catching diseases and show me how to avoid them? Why is there no one to discover and warn me of the presence of catching diseases in my neighborhood and to force affected persons and their families to keep their diseases at home? Why does no one come to our school to teach my children the simple lessons in preserving their health, life, and happiness? Why does no one examine my children each year in the schools and advise me of any physical ailments that may be the source of much suffering to them and a clog to the growth of their minds and bodies? Why does no one make it cheap and easy for me to have such defects corrected when found? Why do I have to pay \$4.00 a piece for getting myself and family vaccinated against typhoid fever when it could be gotten free close at my door? Why can I not likewise get free protection against smallpox, diphtheria, and pneumonia? Having provided myself with a decent and sanitary privy, why is there no one to force my neighbor across the road to do the same? Why is there no one to come to my home and show me how to feed and clothe my little baby in such a way as to give him a fair chance to live and grow strong? A thousand other whys I might ask but they all may be summed up by asking why myself and my neighbors must, through ignorance, continue to bear our scourge of preventable ills and diseases when a few dollars spent on a good health department would do away with a very large portion of them.

The answer to these questions must be sought from the questioner himself and his fellow-citizens. His county does not enjoy such advantages because there has been no one to start a movement to procure them. It is true that the County Commissioners are responsible for not having taken the necessary action. But how did they know their people wanted a health department? Indeed they will never take any action until they see a strong popular demand for it. Few are the Commissioners who will disregard such a demand when properly organized and presented. When they do disregard it, then is the time to get a new set of commissioners.



Having once made the necessary appropriation for a health department the answer to these questions is still not complete. There is the proper man to be secured for health officer, a nurse who is capable and industrious, and a sanitary inspector with like qualifications. It is at this juncture that the advantage of the State's coöperative plan becomes obvious. It is the business of the State Board of Health to know the fitness of persons for this kind of work, and to know those who might be available. It is therefore wise and logical to look to the State Board of Health to handle this duty of selecting the proper workers who, of course, must be acceptable to the county.

The end for which a health department is established is results. The responsibility for satisfaction in this regard rests upon all concerned. Certainly the health officer and his assistants are first to be considered, but they may be without fault and yet fall far short of expectations. They must have the whole-souled coöperation of every individual and every group of individuals if they are to do their best work. Thus the people themselves bear a large portion of the responsibility. And again the State shares in this responsibility. Much of the literature used is supplied by the State, and all the vaccines, etc., are furnished in desired quantities by the State Board of Health. Through its coöperative program the State is able to furnish much timely advice gathered from methods and experiences of other counties working under the same conditions and finally the State is able to maintain a constant check upon the work of any county through comparison with the work of others and by this means is able to protect the county against all grades of inefficiency.

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### FUTURE PLAN OF COUNTY HEALTH WORK

By DR. K. E. MILLER, United States Public Health Service, Director of Bureau of County Health Work for 1920.

Only a short time ago the whole-time county health officer was a novelty. The idea took root and developed with great rapidity in North Carolina, so that approximately half the population of the entire State are living under the protective influence of whole-time health officers. The whole-time health officer has, therefore, become a fixture in the minds and lives of half our entire State, so that the people would no better know how to get along without their health officer than they would know how to dispense with their Sheriff. But progress is a restless creature. We have even passed the stage of talking and thinking in terms of whole-time health officer, and now we think principally in terms of the health department consisting of a health officer, a nurse, a sanitary inspector, and an office assistant. A health department of this nature is the standard adopted for the State's coöperative counties, and is within the reach of most counties in the State under the coöperative plan. Unfortunately, however, the number of counties with which the State can coöperate at present is limited on account of insufficient funds.

The next move of the State Board of Health will be to procure funds to enable it to lend financial assistance to all counties desiring better facilities

for health conservation. Through the passage of a bill now in Congress the State Board of Health is hoping also to offer the aid of another coöperating agency, namely, the United States Public Health Service. By joining the funds from the county, State and Federal Government it will be easy for any county to obtain effective health protection.

While a county health department, as referred to above, is desirable, it is not the only organization capable of doing effective work. At least one whole-time official, however, must be considered the minimum worthy of consideration. Many of the smaller and sparsely settled counties may not be in a position to afford a full-time health department. In such cases they should strive to get a whole-time health officer or at least a whole-time public health nurse. Even now without waiting for further legislation there is no county in North Carolina so small or so poor as not to be able to enjoy the services of a public health nurse. Miss Rose M. Ehrenfeld has recently been appointed by the State Board of Health as Director of Public Health Nursing activities, with authorization from the American Red Cross to use Red Cross funds for the work of the public health nurses.

The plan of County Health Work for the future, therefore, may be summed up as a program for a whole-time health organization of some kind for every county in the State, consisting of either a nurse, a health officer, or a complete health department. And be it emphasized that the facilities for making a start are now available to any county.

*Public Health is purchasable. To any  
community health is a valuable asset. It in-  
sures prosperity; it increases the value of land.  
Health can be maintained only through indi-  
vidual and community effort. Within natural  
limitations, any community can determine its  
own death rate.*

WASHINGTON, D. C. DEPT. OF HYGIENE,  
VENEREAL MENACE NUMBER



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REMOVE THE HOODWINK



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The State Board of Health has a limited quantity of literature on health subjects for free distribution. If you are interested in one or more of the following subjects, or want same sent to a friend, write to the State Board of Health for free literature on that particular subject.

WHOOPING-COUGH  
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### SEX HYGIENE BULLETINS

#### SET A—FOR YOUNG MEN

A Reasonable Sex Life for Men.  
Sexual Hygiene for Young Men.  
Vigorous Manhood.  
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#### SET B—FOR PUBLIC OFFICIALS AND BUSINESS MEN

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Venereal Diseases—A Sociological Study.  
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A State-wide Program for Sex Education.  
List of Reliable Pamphlets.

#### SET C—FOR BOYS

Vigorous Manhood. (Especially for boys 12 years of age and over.)

NOTE—For boys under 12, see "When and How to Tell the Children" (Set D); portions of "Vigorous Manhood" also may be read to younger boys. Boys 15 years and over may be given Bulletin "A Reasonable Sex Life for Men" (see Set A), at the discretion of the parent.

Sexual Hygiene for Young Men.  
List of Reliable Pamphlets.

#### SET D—FOR PARENTS

When and How to Tell the Children.  
Venereal Diseases—A Sociologic Study.  
The Need for Sex Education.  
List of Reliable Pamphlets.

#### SET E—FOR GIRLS AND YOUNG WOMEN

Your Country Needs You. (Especially for girls 11 years of age and over.)

NOTE.—For girls under 11, see "When and How to Tell the Children." (Set D); portions of "Your Country Needs You" also may be read to younger girls. Girls 15 and over may be given "The Nation's Call to Young Women," at the discretion of the parent.

The Nation's Call to Young Women.  
List of Reliable Pamphlets.

#### SET F—FOR TEACHERS

The School Teacher and Sex Education.  
Sex Education in the Home and High School.  
Venereal Diseases—A Sociologic Study.  
Smash the Line.  
The Need for Sex Education.

Any of the above will be sent without charge. Please send for only those bulletins for which you have definite use.

# THE Health Bulletin



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## THE VENEREAL MENACE AND THE REMEDY

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Director, Bureau of Venereal Diseases

One of the greatest victories in the world war was the victory over disease. In previous wars the disease death rate has been higher than the battle death rate, but in this war the ratio was reversed. Thus, five times as many American soldiers died of disease as were killed in battle in the Spanish-American War, while less than one-fourth of the deaths among the American Expeditionary Forces during the late war were due to disease.

Furthermore, devastating epidemics, such as have followed other great wars, have not resulted from the scattering of returned prisoners and demobilized troops to all parts of the world since the armistice. This is a victory of which public health authorities may well be proud, for it points the way to better health conditions in times of peace.

Not only were the known diseases kept under control, but in at least one instance knowledge was gained concerning a new disease which appeared during the war. While the battles were raging, American scientists, with the aid of American men who offered themselves as sacrifices for the experiments, learned the method by which trench fever is transmitted and thus added a new disease to the growing list of preventable diseases. This achievement

in wresting a new bit of knowledge from Nature was made possible by our modern conception of disease as being a biological phenomenon subject to natural law instead of a visitation of wrath in punishment for sin.

Modern discoveries concerning the causes and methods of transmission of many diseases have been so impressed upon the minds of the people that scientific methods of prevention are being extended into new fields. Under the pressure of war necessity for exerting a full measure of manpower, it was possible to attack boldly a group of diseases which heretofore have been mentioned only with bated breath. The reason for such great reticence, amounting to what has been called a "conspiracy of silence," concerning this group of diseases, is that they are so frequently incidental to a breach of morality. But as the veil of superstition has been lifted and the light of science allowed to illuminate dark places, it has been found that fully half the victims of venereal disease are innocent of wrong-doing. An appreciation of this fact has helped to modify public opinion concerning these diseases so as to permit the development in record time of the greatest disease prevention campaign ever known in history.

### Comparative prevalence of Venereal Diseases and other important communicable diseases in the U. S. Army.

Venereal Diseases .....	102.3
Other Communicable Diseases .....	29.4

Pneumonia, scarlet fever, typhoid, and paratyphoid. (Measles not included.)

The figures above represents the annual rate per 1,000 for all troops in the United States, based on the reports from September 21, 1917, to May 31, 1918. These figures are accurate for purposes of comparison only. Prepared from reports to the Surgeon General of the Army.

### Comparison of the number of cases of Venereal Diseases contracted before and after enlistment.

Before enlistment .... 5

After enlistment ..... 1

The number of cases before enlistment includes all uncured cases, old and new, as compared with the new cases contracted after enlistment. The great contrast, however, is mainly due to the better protection given to soldiers than is given most men and boys in civil life.

The above estimate is based on reports from Camps Sherman, Lee, Upton, Meade, Custer, Kearney, and the Western Department from October 25, 1917, to May 1, 1918. (See Venereal Disease Control in the Army. W. F. Snow, M.D., and W. A. Sawyer, M.D., Majors, M. R. C., U. S. Army. Journal American Medical Ass'n, August 10, 1918, p. 456.)

This campaign, first launched as an emergency war measure, proved a success from the start. It is well known that more ineffectiveness and unfitness for military duty are caused by venereal disease than by any other group of diseases that sap the strength of an army. Heretofore a great increase in the prevalence of venereal disease has always resulted from war. Notwithstanding these facts, the vigorous measures taken for the protection of American soldiers were so effective that the American Expeditionary Forces had the lowest venereal disease rate of any army in the field.

These war measures were taken to insure success in America's first combat with a great military power. Now that peace has come with its urgent demand for production to make up for the loss and waste of war, the necessity for continuing the campaign against venereal diseases in order to maintain efficiency in industry is apparent to all who are familiar with the situation. To be sure, efficiency in industry is a material end, but it is an end calculated to make a strong appeal to the man of affairs con-

cerned with the production and distribution of material necessities.

There is, however, a more important reason why we humans should combat venereal disease. One of these diseases, namely, syphilis, may be transmitted to offspring with disastrous results. Gonorrhea often produces sterility and causes many marriages to be childless. Thus venereal diseases must be prevented, not only for the sake of efficiency in industry, but also for the sake of preserving the race and passing a heritage of health on to posterity.

In order to understand just what the venereal menace really is, it is necessary to know something of the diseases themselves. There are two or three diseases of minor importance, such as chancroid and balanitis gangrenosa, but the two great diseases which belong to this group are gonorrhea and syphilis.

Gonorrhea is caused by a germ which is a vegetable parasite that grows on mucous membranes and causes an inflammatory condition of the membrane and underlying tissues. The disease affects the sex organs chiefly because it is usually trans-



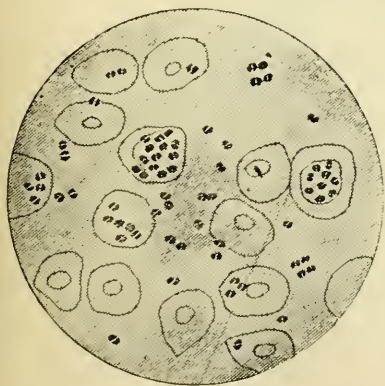
mitted by sex contact. It may, however, affect other parts of the body. The disease may occur on any mucous membrane. It not infrequently affects the eyes. Inflammation of the eyes in newly born babes, or babies' sore eyes, is frequently due to the germ of gonorrhea obtained from the mother at the time of birth. Older persons may also sometimes have the eyes infected with the germ of gonorrhea. Much of the blindness in the country is due to this cause. Some authorities estimate that as much as one-fourth of all the blindness at all ages and three-fourths of the blindness in young infants is due to gonorrheal inflammation of the eyes.

After growing for a while on a mucous membrane, the germ of gonorrhea, commonly called the gonococcus, may get into the blood and reach other parts of the body. Sometimes the germs lodge in the heart and cause serious disease of the heart. They sometimes lodge in the joints and cause gonorrheal rheumatism. The germ of gonorrhea is a very tiny germ and can be seen only by the use of a powerful microscope, but it causes much damage. Not only does it cause much blindness and crippling due to infection of the eyes and joints, but it is a frequent cause of sterility in both men and women, thus depriving them of the privilege

of parenthood. This germ also makes necessary most of the serious operations upon the sex organs of women. An appreciation of all the damage done by gonorrhea has led to a great change in point of view concerning its importance. No longer is it regarded as of no more consequence than a bad cold, but a better knowledge of its far-reaching effects has caused it to be classed as one of the great diseases of mankind. It is one of the most prevalent of the serious diseases which afflict the people of North Carolina.

The other important venereal disease, usually regarded as in some respects the more important of the two, is syphilis. This disease is caused by a tiny animal parasite or germ shaped somewhat like a corkscrew. This parasite must enter the body and get into the blood before it can cause the disease. It may enter the body through any portion of the skin or mucuous membrane. The spirocheta, as the germ is called, has the power to move around freely in a fluid and is believed to have the power to penetrate the unbroken skin or mucous membrane with which it comes in contact if kept moist a sufficient length of time. It certainly has the power to penetrate through any scratch or other break in the protective covering of the body. At the point of entrance there develops in the course of three or four weeks a hard lump or nodule which is called a chancre. This nodule or chancre usually forms an open sore, which may or may not give much annoyance at the time. In fact, a chancre on the lip is not infrequently mistaken for an ordinary cold sore in the beginning. The chancre is the first stage of syphilis.

In a few weeks, if proper treatment is not given, the second stage of syphilis comes on, in which there is a rash or an eruption on the body that may look like the eruption of



GONOCOCCI

almost any other disease. During this stage the hair often falls out and the mouth gets sore. If improper or insufficient treatment is given, or sometimes even when no treatment is given, this rash may disappear after a while and the infected person may think he is getting well. But the germs have only gone to the deeper tissues where they survive and cause trouble later in life.

germs frequently cause degenerative changes in the blood vessels, the heart, the liver, the kidneys or other parts of the body. Many of the cases of paralysis or apoplexy occurring in early or middle life are due to syphilitic infection of the blood vessels. Many deaths from heart disease are caused by syphilitic infection of the heart muscle. Many deaths due to degenerative changes in



#### SPIROCHAETA

The germ of syphilis (*Spirochaeta pallida*) by dark field illumination in the secretions from a syphilitic wart (condyloma). The living spiral organism highly magnified. The bright circles are red blood cells.

These later troubles, which are many in number and varied in character, constitute what is called the third stage of syphilis. They may come on fifteen or twenty years or even longer after the first stage of the disease. In case the germs attack the nervous system they may cause locomotor ataxia, or they may cause a form of insanity known as paresis or softening of the brain. The

other vital organs are also attributed to syphilis. Thus syphilis is frequently an indirect cause of death. Indeed, it is regarded by some authorities as ranking along with tuberculosis in importance as a cause of death. For this reason syphilis and tuberculosis are looked upon as the two most important diseases in the temperate zone. Both together are held responsible for about one-



# THE PARENTS PART



GIVE THE CHILD A SQUARE DEAL

fifth of all deaths in countries like England and the United States.

These two great diseases are alike in another respect. Each may affect almost any part of the body, and may closely resemble almost any other disease. So true is this of syphilis that Dr. Osler once remarked that if a physician knows syphilis in all its forms he knows all possible forms and manifestations of any other disease.

But this is not all the damage wrought by syphilis. It is the one great disease we know which may be transmitted from one generation to another. Without stopping to discuss the point as to whether or not it is congenital or truly hereditary according to the more technical meanings of the terms, it is enough for practical purposes to know that the child of a syphilitic parent may be born with syphilis. In fact, it may be born dead, or it may die before time for birth as a result of syphilitic infection. When born alive such a child may show symptoms of the disease at once or may appear normal at birth and develop symptoms later.

These, then, are some of the tragedies which follow "the sowing of wild oats." Thinking he is cured of an old infection, a man may marry and settle down only to find that his wife soon becomes a chronic invalid or is compelled to undergo a mutilating surgical operation; that he cannot have children or can have only one; that his children are born dead or diseased, or that he himself becomes a chronic sufferer from some of the after effects of venereal disease, or is stricken helpless by paralysis or insanity in the very prime of life. Fortunately venereal diseases can be cured if proper treatment by a skilled physician is continued for a sufficient length of time. These diseases can also be prevented and prevention is far better than cure.

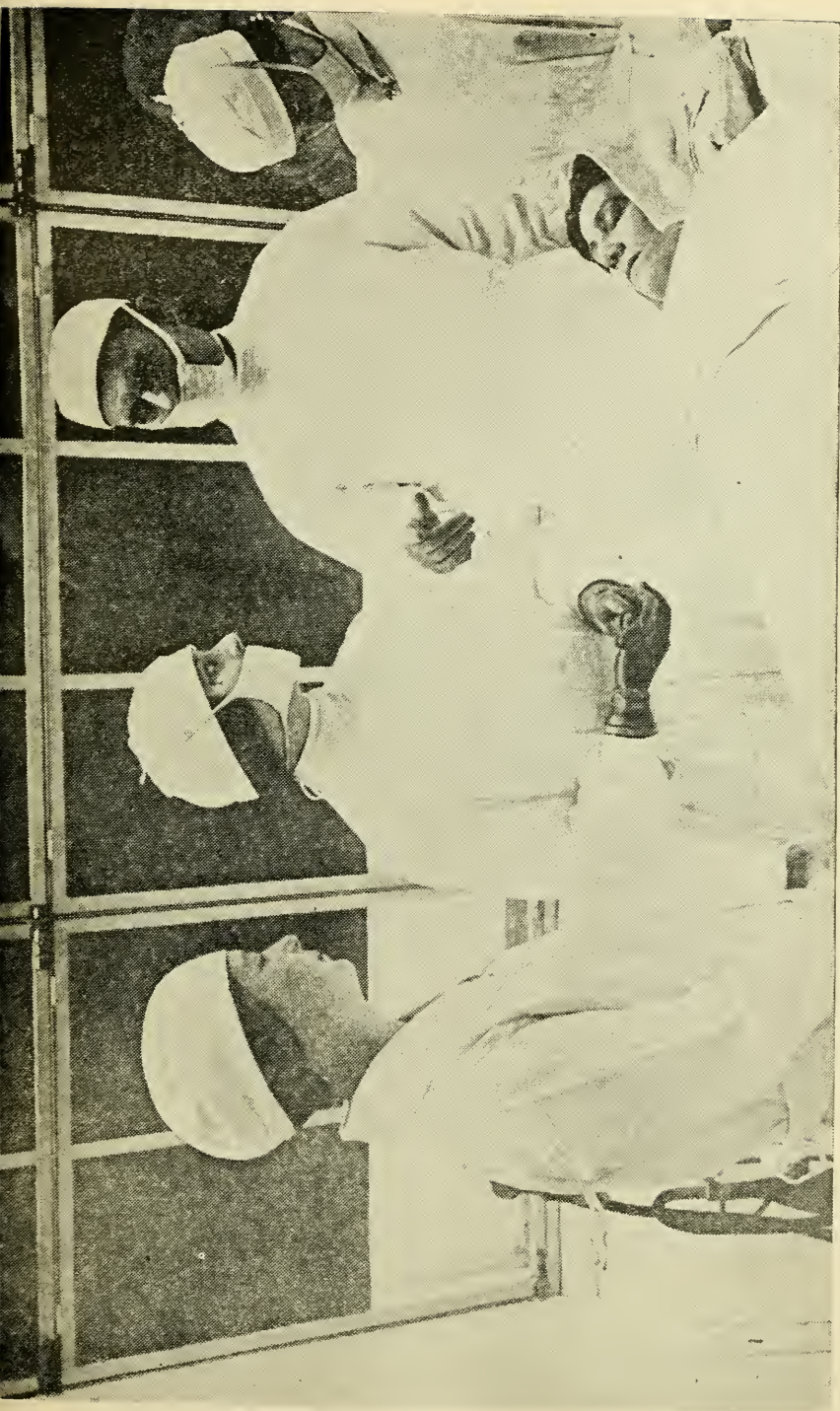
### Methods of Transmission

The germs of venereal disease do not live long outside the body except under very special conditions. They are sensitive to changes of temperature and are usually readily killed by drying. Such delicate germs are not conveyed from one person to another through the air. They must be transferred from the infected to the uninfected in a moist state if they are to be kept alive and cause disease. This is why the diseases are usually transmitted by sex contact, but there are also other methods of transmission. The germs of gonorrhea may be conveyed to the eyes by means of a towel. A toilet seat soiled with gonorrheal pus is a possible means of transmission, especially in the case of little girls. The germs may also be conveyed by means of a syringe used by an infected person.

Syphilis may be transmitted by kissing, by the use of the common drinking cup or by otherwise coming in close contact with an infected person. A case is on record where a young man with the first sore of syphilis on his lip went to a party where kissing games were played. He kissed about a dozen girls and half of them developed chancre of the lip. Syphilis may also be spread by the ordinary contact of school life. An instance that comes to mind in this connection is that of a large school in a western city where eleven cases of syphilis were found among the school children. Apparently most of them had been contracted by the ordinary contact incident to their association in school. Not infrequently a physician or nurse contracts syphilis by handling syphilitic patients. Thus syphilis may be said to be in a sense an occupational disease with physicians and nurses.

All of these facts serve to emphasize the point that no one is entirely free from danger so long as venereal





### MOTHERS, TELL YOUR DAUGHTERS

A large percentage of the operations on the sex organs of women are due to gonorrhea. Are you sure that the man who is to marry your daughter is free from venereal disease?

diseases exist. No matter how exemplary one's conduct may be, there is always a chance, which is not so remote as many of us imagine, for an accidental infection or an infection acquired from a husband, or occasionally from a wife. Many women are infected by their husbands who thought they were cured before they married.

For the reasons indicated above, some persons regard the term "venereal disease" as a misnomer. It is no doubt true that the term is somewhat unfortunate in view of present knowledge, but long usage has firmly fixed it in the language, and there is no other satisfactory term for this group of diseases. After all, the name is of secondary importance. We have come to realize that because of the large number of accidental and innocent infections these diseases must be looked upon as misfortunes the same as any other disease, and treated accordingly. Even when acquired by illicit relations, humanitarian considerations require that the infected persons be treated, both for their own sake and for the sake of those with whom they come in contact, and also for the sake of their offspring. It is an appreciation of this fact that has led to the establishment of clinics for the treatment of venereal disease, that has led hospital authorities to open hospital doors heretofore closed to such cases, that has induced municipalities, States and the Federal Government to make appropriations to provide treatment for indigent patients who are infected, and that has changed in an important way the whole attitude of the public toward the venereal disease problem and toward those who are infected with such diseases.

### The Prevalence of Venereal Diseases

The revelations of the war concerning the prevalence of venereal diseases have been astounding. The ex-

amination of so large a number of drafted men gave an opportunity to measure the prevalence in the average population. When North Carolina's quota of the second draft came up for examination it was found that six and three-fourths per cent, or about one out of every fifteen, were suffering from venereal disease at the time of examination. This does not include the number who had been infected and cured before they were drafted. Some notion of what this rate of infection means to industry may be gained by considering that out of every 1,000 men of military age employed in a large industry, 67 would have their efficiency impaired at all times by infection with venereal disease. This fact must of necessity enter into the calculation of wage scales, prices of products and other adjustments in the industrial world. Thus it is to the interest of the employer and the employed alike to limit the spread of venereal disease.

Other figures available concerning the prevalence of venereal disease are more or less fragmentary in character but some of them are of sufficient importance to be mentioned. For example, six and one-half per cent of nearly 5,000 persons coming to autopsy at Bellevue Hospital in New York had some ailment resulting from syphilis which was apparent to the eye without the use of a microscope. Dr. Warthin, of Ann Arbor, Michigan, has made a careful study of persons coming to autopsy at the hospital of the medical school in that city, and claims that 40 per cent of them showed the effects of syphilitic infection when the tissues were examined with a microscope. These figures are so startling that other workers hesitate to accept them without corroboration. The estimation usually made of the prevalence of syphilis in the general population varies from 5 to 15 per cent. Warthin





### ADMINISTERING ARSEPHENAMINE FOR SYPHILIS

All cases of syphilis should be given both arsephenamine and mercury, and treatment continued until a cure is effected.

is of the opinion that these figures are too low. He thinks that double this proportion would still be a conservative estimate. It is a well-known fact that gonorrhea is far more prevalent than syphilis.

The importance of syphilis as a cause of death has already been mentioned. Some authorities regard it as the greatest single cause of death among English speaking peoples. It is true that not many deaths are attributed to syphilis in the death reports, but it is an indirect cause of many deaths attributed to apoplexy, paralysis, hemorrhage in the brain, heart disease, hardening of the arteries, and degenerative diseases of other organs. On account of its indirect relation to death from some of these other causes, syphilis is held responsible for a very large number of deaths of men between the ages of 40 and 60. The disease is not so severe for women as for men.

One of the important aspects of the venereal disease problem is its relation to child life and reproduction. In a study of syphilis in relation to infant mortality, Dr. P. C. Jeans, of St. Louis, concluded that from 10 to 20 per cent of adult males and 10 per cent of married women are syphilitic; that 75 per cent of the offspring of syphilitic families are syphilitic; that 30 per cent of pregnancies in syphilitic families result in death before term as against the normal rate of 10 per cent; that 30 per cent of living children in syphilitic families die in infancy; that 25 to 30 per cent of syphilitic infants die of syphilis; that but 17 per cent of all pregnancies in syphilitic families result in healthy children who survive infancy; that about 5 per cent of all infants are syphilitic and that about  $3\frac{1}{2}$  per cent of all infant deaths in St. Louis were due to syphilis.

The British Royal Commission for the study of venereal diseases made a study of 150 families that were

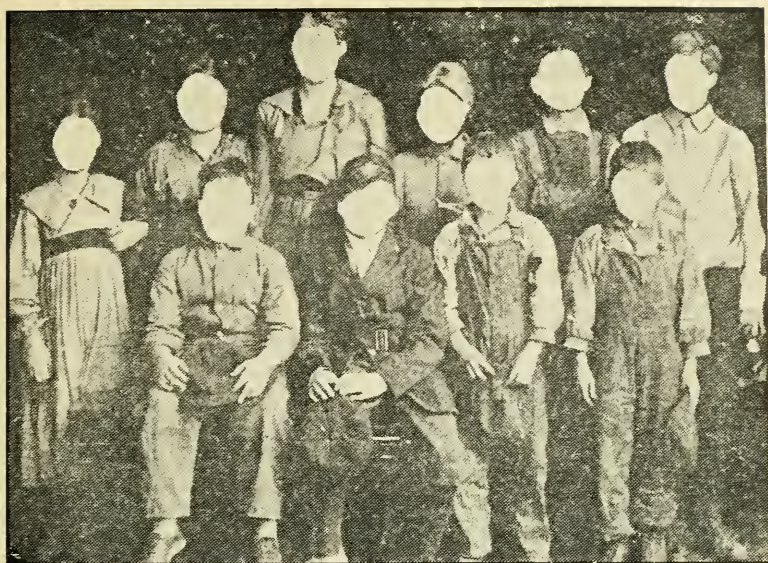
syphilitic and 150 that were not syphilitic and found the same disastrous results of syphilitic infection to child life as were reported by Dr. Jeans. Thus one of the big problems in child hygiene is the venereal disease problem, especially syphilis.

In North Carolina as many as 1,000 cases of venereal disease per month have been reported to the State Board of Health by physicians, while druggists have reported as many as 2,000 sales of venereal disease remedies per month. This does not show all the cases that occur, for not all physicians and druggists have begun reporting as yet. It does mean, however, that venereal diseases are more prevalent in North Carolina than other communicable diseases. The next question that naturally arises is what to do about it.

### How to Combat Venereal Disease

In considering methods of combating venereal disease it may be well to emphasize again the fact that these diseases are not punishment for sin. About half the cases of infection are innocently acquired, and nearly all the innocent victims are women and children. Surely no one would wish to have innocent women and children suffer unnecessarily for the conduct of the husband and father; yet this is exactly what has happened as a result of our past attitude toward venereal disease. The more modern view that such disease is incidental to sex irregularity, rather than a punishment therefor, has resulted in an entirely different attitude towards persons who are infected with these diseases. Owing to this change in attitude, it is now possible to approach the subject from a scientific point of view, and handle venereal diseases in a rational common-sense manner, the same as other diseases are handled.





#### VICTIMS OF GONORRHEA

These children were recent patients at a venereal clinic, each one a victim of gonorrhea. Faces are covered to prevent identification

Three distinct lines of activity are essential in any complete program of venereal disease control. These are:

1. Medical measures, including the treatment of persons infected with venereal disease to render them non-infectious, and the forcible detention under quarantine of infected persons who cannot be trusted to avoid exposing others to infection while under treatment.

2. Repressive measures against prostitution, which is recognized as the great source of venereal disease.

3. Educational measures for the purpose of disseminating accurate information concerning venereal diseases and arousing the public to adopt vigorous methods for their prevention.

The provision of facilities for proper recreation is a fourth important activity in the indirect attack upon venereal disease. Infection occurs during leisure time. Wholesome recreation diverts attention and lessens exposure to infection. Recrea-

tion is a community problem rather than a strictly public health problem. It cannot be adequately discussed here, but is mentioned for the sake of completeness.

The necessity for proper treatment of infected persons is more urgent in venereal disease than in some other communicable diseases. This is due to the fact that venereal diseases frequently become chronic and the patient may thus become a "carrier," capable of transmitting infection to others for a long period of time. Some communicable diseases like smallpox are called "self-limited" diseases, because the patient soon recovers and becomes incapable of transmitting infection to others.

Treatment for the great majority of venereal disease patients will be given by physicians in private practice employed by the patients for that purpose. There are a number of patients, however, who cannot afford to pay for treatment. The obligation of the community to provide

treatment for such cases is becoming more generally recognized; in fact the community is obliged to provide treatment as a means of self-protection, for a person infected with venereal disease in an infectious stage is a menace to all with whom he comes in contact. In the larger centers of population the most convenient and economical way of providing treatment at public expense for such patients is by means of clinics. In carrying out the government program for treatment in North Carolina, clinics have been established in the cities of Asheville, Charlotte, Clinton, Fayetteville, Goldsboro, Greensboro, High Point, Rocky Mount, Raleigh, Wilmington and Winston-Salem. This includes all the cities in North Carolina, except Durham, with an estimated population of fifteen thousand or more, and a few of smaller size. The total population of these cities and the counties in which they are located is about 20 per cent of the population of the entire State. Thus the establishment of clinics in these larger cities does not provide for the treatment of indigent patients in the smaller towns and rural communities, where about 80 per cent of the people reside. Plans are under way for insuring proper treatment to all who require it and are not able to pay a physician in private practice for his service.

It is clearly recognized that no one but a skilled physician is qualified to administer proper treatment for venereal disease. In fact, the law prohibits any one but a legally qualified physician from prescribing treatment for such cases. Still there are a number of people who foolishly buy alleged remedies at drug stores and try to treat themselves. Fortunately, as the public gains information on this point, the number of persons who try to treat themselves for venereal disease is steadily diminishing.

With regard to the second great line of activity necessary for the prevention of venereal disease, it may be noted that the positive stand taken on this question by health authorities generally is a distinct advance over views formerly held. Throughout the ages numerous attempts at regulating prostitution have been made, but no such attempts have ever proven successful. At last it has been clearly recognized that the only attitude society can assume toward prostitution with any hope of success in combating venereal disease is one of unremitting antagonism. Prostitution in all its various forms and manifestations must be repressed with a strong hand if venereal disease control measures are to succeed. The stand on this point is positive and uncompromising. No truly enlightened community will permit an open red light district to exist, and most communities are now taking active measures against prostitution in all its forms.

In carrying out repressive measures it is essential that the strong hand of the law fall with equal weight upon both men and women who are engaged in commercialized vice. The laws of North Carolina make the male partner of the prostitute equally guilty with the prostitute herself. Thus there is no warrant in law for prosecuting one and not the other. Experience has shown, however, that from the standpoint of repressing prostitution it is also necessary to punish the male accomplice. The male accomplice is the taxi driver, the porter, the bell boy or other person who acts as a solicitor for prostitutes. Vigorous prosecution of such persons has been found effective in rendering prostitution unprofitable, and causing prostitutes to seek other means of gaining a livelihood. Thus after red-light districts are closed and prostitutes find it necessary to



employ accomplices to bring them trade, one of the most effective means of combating prostitution is to punish the accomplice.

There are plenty of laws in North Carolina for the repression of prostitution; the only thing needful to make these laws effective is an aroused public opinion to back up the officials in enforcing them. In general it may be said that the officials of any community are as efficient in enforcing the laws as the public wants them to be. It is possible for prostitution to be practically wiped out of the State if the public so desires. With prostitution wiped out, the venereal disease problem would soon be greatly diminished in importance, because of the greatly lessened prevalence of such diseases. The law of North Carolina requires health officials to co-operate with other officials whose duty it is to enforce laws against prostitution.

In planning the educational campaign it is essential to keep clearly in mind the ends to be attained. The mere giving of information concerning venereal disease is not enough. In building for permanent results it is necessary to build into the moral fiber of the people. Recognition of this fact is one of the factors that has led to the inclusion of sex education as a part of the educational program in the campaign against venereal disease. Sex education efforts have taken rather definite form in the "Keeping Fit" campaign being waged throughout the country among boys of high school age, and the corresponding campaign among girls. Eventually, this line of activity will be turned over to the schools where it belongs, and the health authorities will attend to the more strictly medical aspects of the problem. At present the health authorities are pointing the way toward sex education as a part of the indirect attack upon venereal disease.

An illustration of building into the moral fiber of the people is afforded by the growing demand for a single standard of sex conduct for men and women. The present high standard for women has developed to meet a race necessity. If the race is to progress through utilizing the lengthened period of infancy in the human species for educating the young, it is necessary to know who are the fathers of children so that responsibility for their education may be fixed. For this reason the conduct of the mother must be above reproach, and civilized humanity has fixed the standard of sex conduct for women higher than for men. The necessity for maintaining the high standard for women is just as urgent as ever, and the necessity for establishing and maintaining a high standard for men is now realized.

At no time in the world's history have greater demands been made upon individual power and endurance than at present. If civilized men are to meet these demands it is essential to eliminate elements of weakness, either physical or mental. Thus the control of venereal disease is now looked upon as a necessity if the human race is to continue progress toward a realization of its highest aspirations. An appreciation of this necessity will cause a high standard of sex conduct to be fixed for men as a matter of racial self-preservation. The race will not permit men to continue bringing venereal disease into the family as in the past.

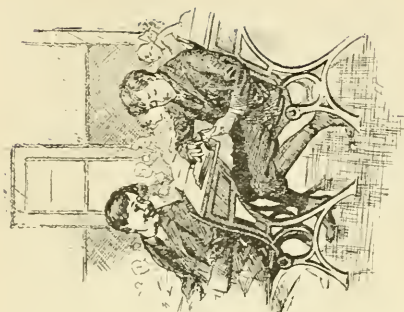
To be effective in attaining this end, educational measures must make the point clear to all concerned that venereal disease is a race menace, and that every male member of society is under obligation to himself and his family to avoid exposure to such diseases. When the necessity for maintaining an untainted race stock is felt as keenly as the necessity for knowing the paternity of offspring, there



1 "Yes, son, the doctor brought baby in a basket."



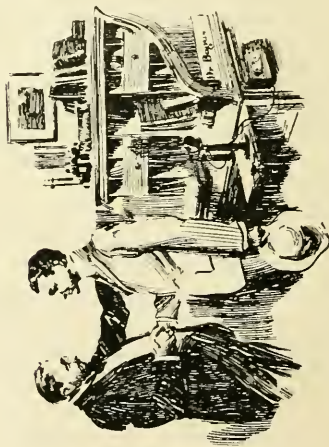
2 A different story from older boys



3 A note seen at school leaves most wrong ideas about sex



4 He goes with dangerous companions and some some "wild cats"



5 Dr Bogus (a quack) tells him that his disease can be easily cured



6 But when he marries and their baby comes, it is found to be defective



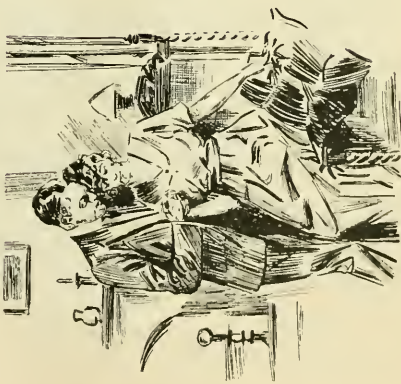
1 The true story of "How Life Begins" is received from his mother



2 He is given wholesome books of instruction on sex matters



3 Out-of-door play helps to keep his mind in right channels



4 He has a clean record to offer the girl he loves



5 A wedding in which neither party has anything to fear



6 A happy home and healthy children



will be a basic motive for a single standard of sex conduct for men and women.

Thus, whether the discussion be limited to health and efficiency in industry or extended into the field of morals, it all comes back to venereal disease as an individual and a race menace. The eradication of these diseases requires proper treatment for infected persons, the repression of prostitution, and the education of

the people concerning the menace. Successful educational efforts will seek first to influence individual conduct through the promotion of self-control, both because it is the decent and proper thing to do and because lack of self-control carries a hazard of infection, and second, to stimulate public action for the treatment of infected persons and the repression of prostitution.

## EDUCATIONAL PROGRAM

HENRY P. COOR

Director of Division of Education, Bureau of Venereal Diseases

For the reasons that the venereal diseases spread largely because of public ignorance concerning them, and education is one of the most important and fundamental ways of preventing their occurrence, the Educational Division of the Bureau of Venereal Diseases will function largely in the State-wide campaign to control or eliminate these diseases. Funds are available for an intensive campaign and plans have been developed to carry to the people of the State detailed information concerning the

### Venereal Menace

Since the venereal diseases are not respecters of persons—all alike, rich and poor, old and young, innocent and immoral, are open to infection—a very strenuous effort will be made to reach all colors, classes, sorts and conditions of people over the State with definite information concerning the diseases.

#### Purpose

The purpose of this educational effort is threefold:

1. To take to the people of the State detailed, authentic information concerning—

- (a) The startling prevalence and ravages of the diseases and the rapid way in which they are undermining the race.

- (b) The methods and availability of treatment. The harm done individuals and society because of the use of "Quack Medicines" and the practice of "Quack Doctors."

- (c) The necessity for the repression of "prostitutes," the chief carriers of the diseases.

- (d) The methods and measures now being used by both the State Board of Health and the United States Public Health Service in combating these diseases.

2. To stimulate leaders, organizations and institutions to a new and vital interest in sex as it is related to life and as an important factor in the elimination of venereal diseases.

3. To enlist the live interest and active co-operation of every available person, organization and institution in this great "People's War" against the VENEREAL MENACE.

#### Methods

Publicity.—Foremost among the methods used to take the venereal message to the people of the State



are the news and editorial columns of the daily and weekly press. No agency can reach so many people or is more willing to be used than the press. A campaign of publicity is now under way and steady streams of illuminating information concerning the diseases in North Carolina as already indicated will flow over the State.

**Sex Education.**—In today's warfare on venereal diseases, as declared by the Government, it is being discovered anew that this generation is suffering not only from its own sins, but also from those of its parents and grandparents. In the interpretation of this rediscovery, however, insufficient emphasis is placed upon the sins of omission, for it was the shortcomings of our parents as well as their transgressions which have left us this heritage of venereal diseases.

Chief among the shortcomings of the last generation was the failure to sanely instruct this generation in the fundamentally important and supremely vital message of sex. The recent careful investigation by M. J. Exner among one thousand college men revealed the startling fact that less than 10 per cent of parents assume their responsibilities in this respect.

In other words, over 90 per cent of the nation's youth is gaining its sex information from unwholesome, "open sewer" sources and simultaneously failing to receive the advantage of the high degree of immunization from subsequent venereal infection which adequate education affords.

In any modern warfare, propaganda plays an important role, and it is only the employment of the finest strategy, for the Government in its

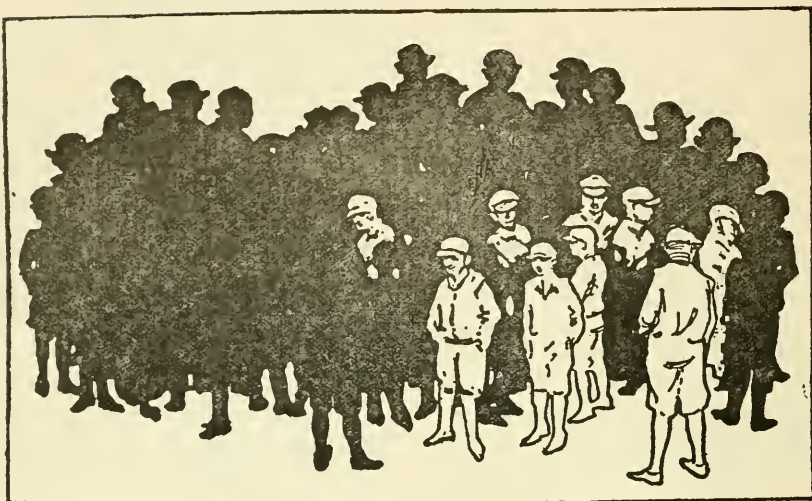


THESE BOYS ARE BLIND

Because their mothers had gonorrhea, in most cases caught from the father. Most of the blindness of babies is caused by the germs of gonorrhea

## TWO KINDS OF SEX EDUCATION

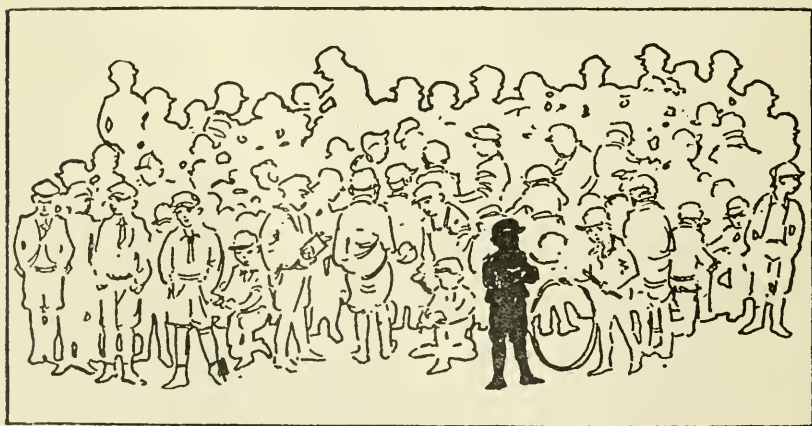
## Effect of First Sex Impressions from Boy and Girl Associates and Miscellaneous Sources



The statements of college men indicate that 91.5 per cent received their first permanent impression about sex from unwholesome sources.

In answer to the question, "What, in general, was the effect of this information upon you, as you look back on it now?" 79 per cent (indicated by black) said the effect was bad.

## Effect of Sex Instruction from Lectures, Parents, and Other Wholesome Sources



The statements of college men indicate that 94.5 per cent had received some sex instruction from parents, teachers, pamphlets, lectures, and other wholesome sources.

In answer to the question, "Please give fully your opinion regarding the influence of this instruction on your life," only 1.2 per cent (indicated by black) said the effect was bad.

These diagrams are based on the results of Dr. Exner's study of 948 college men.

Boy of 15½ Years.



The average age at which boys receive sex instruction from wholesome sources

Boy of 13½ Years.



The average age at which boys are likely to begin some form of sexual practice

Boy of 9½ Years.



The average age at which boys receive their first permanent sex impressions, usually through improper sources



warfare on venereal diseases, to undertake a system of "back-fire," educational propaganda to overcome the enemy. This generation must not fail to adequately instruct the coming generation in the matter of sex, if the scourge of venereal diseases, with their heart-rending wake of insanity, infirmity, suffering and death, is to be eradicated.

**Moving Pictures and Exhibits.**—Another very effective method that will be used to take information concerning the venereal diseases is the medium of Motion Pictures. The best available films telling the story of the Venereal Menace, at once interesting and accurate, for adults and older young men and women, such as "Fit to Win," "The End of the Road," "Animated Diagram" and "How Life Begins," have been secured. The plan for the larger cities is that these films will be shown for a period of three or four days under the auspices of the State Board of Health and the United States Public Health Service in co-operation with a local committee. Special showings will be made separately for men, older boys, women and older girls of both races.

In connection with the showing of the films, a series of attractive card

and slide exhibits dealing with the whole problem of venereal diseases, the causes, the danger and the remedies will be displayed. A "Keeping Fit" exhibit for older boys and adults will also be shown.

The co-operation of such State agencies as the Home Demonstration Department, State Board of Public Welfare, Bureau of Community Service and others will make possible the taking of both the motion pictures and exhibits to that very large constituency, the rural population of the State.

The colleges, both male and female, offer an unusual opportunity to furnish our future leaders and parents with definite information concerning the diseases. In addition it is an opportunity to challenge them to share in the task of completely crushing the greatest present-day enemy of the nation and race.

In the industrial communities a special campaign will be conducted in an effort to get employer and employee to join hands in a combined attack on the diseases, for, aside from other questions involved, the venereal diseases pay neither in happiness nor in profit to employer or employee.

## THE "KEEPING FIT" CAMPAIGN

W. L. HUGHES

Associate Director Division of Education, Bureau of Venereal Diseases

The "Keeping Fit" campaign in North Carolina is based upon an exhibit prepared by the United States Public Health Service. The exhibit is available in either display card or lantern slide form, in both of which some excellent color effects have been accomplished. Leading educators, clergy and social workers unite to heartily endorse it, as enunciating just the challenging message to older

boys for which they have been eagerly, but for the most part vainly, groping.

The exhibit is reinforced by a very attractive pamphlet of the same title, which carries on its front page a personal letter from Governor Bickett to the State's older boyhood. The pamphlet is intended primarily for distribution at the close of a display of the exhibit.

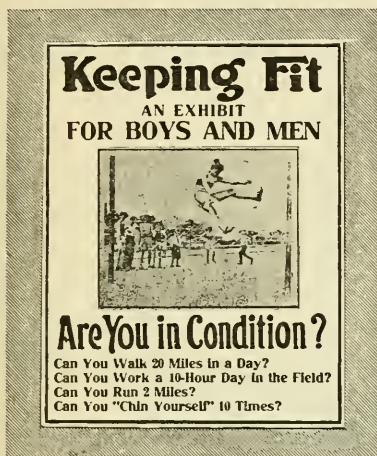


Intensive campaign methods have been adopted in the hope of reaching every high school in the State before June. The State has been divided into fourteen districts with a supervisor in charge of each. The district supervisors in turn are organizing

boys and nearly 50 per cent of the others by July.

Schools, churches, factories, mills, community organizations, etc., may arrange to use without cost the exhibit among boys of the ages mentioned by making written application. In presenting the exhibit a "sex" vocabulary is not needed. Either cards or slides speak for themselves. Complete printed directions will be furnished with each exhibit. The card exhibit consists of twenty-four cards each 22 x 28 inches and the slide exhibit contains fifty slides. Pamphlets to accompany the exhibit will also be supplied in any quantity without cost.

Governor Bickett has challenged the older boyhood of the State to "Get Fit and Keep Fit." In a ringing message of challenge to a high cause the



their counties with a county supervisor in each county. Extreme care is being exercised in the selection of these men, in order to get men who have a friendly approach to boys and who can create a high-toned atmosphere in which to present the exhibit. Each man is given proper credentials from the State office to make it patent to all co-operating schools or other organizations that the supervisor is officially representing the Bureau.

The exhibit, with accompanying literature, is intended for boys in the three upper grades of high school and such other boys, whether in school or out, who are their equal in physiological development. The age limits of this group are roughly fifteen to twenty years. Of these ages there are approximately in this State 32,739 employed boys, 68,116 rural boys and 15,169 school boys. The campaign contemplates reaching with the "Keeping Fit" message all the school



THE PITY OF IT

The innocent, like this little blind girl, suffer from gonorrhea and syphilis

Governor bids the State's youth to come through clean for tomorrow.

The letter follows:

Raleigh, N. C., Nov. 11, 1919.

To the Younger Men of North Carolina:

Is there grit enough in your makeup that a man's challenge to you would strike fire? THERE IS!

Do I not recall with a thrill that today is the world's first anniversary of the world war armistice, and do I not recall with even greater thrill that the first smash of the boasted German line was administered by the sons of North Carolina? That heroic event, paving the way for the armistice, is proof sufficient that the boys of the Old North State will rise to a man's challenge, even when the stake is life or death.

There are issues not far removed in the future, determining the whole course and destiny of our national life, and even the peace of the world,

which must of necessity be solved by you, the younger citizens of today. Think with me for a moment. Isn't the Government employing the finest strategy in determining to spend its greatest effort in training its next generation to fullest fitness?

As Governor of your Commonwealth, as a father and friend of younger men, as I prefer to call today's boys, but greatest of all as an American citizen, I appeal to you to read and reread this pamphlet. Actually absorb it. And then, under Heaven, soberly pledge that you will earnestly endeavor to come through to mature American citizenship, assuming whatever duties that glorious citizenship may impose, clean-limbed, strong-moraled, clear-eyed and keen-minded.

Younger men of today—I challenge you man to man.

Personally yours,

(S) T. W. BICKETT.

## WORK AMONG WOMEN AND GIRLS

ANNE JANE SIMPSON

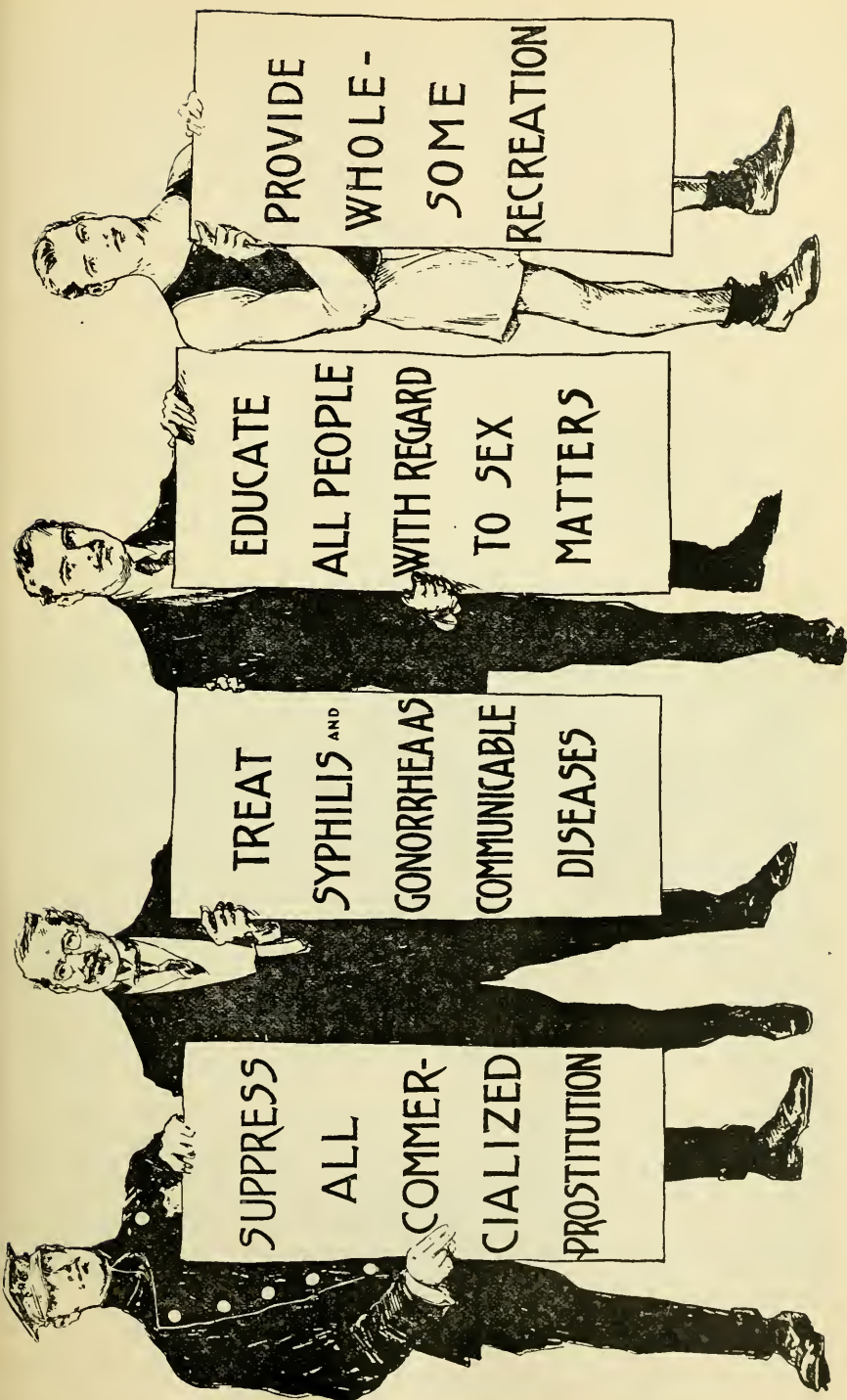
Director of Women's Work, Division of Education, Bureau of Venereal Diseases

### Reasons

Work among women and girls in the State of North Carolina has come to the front because of the important part they play in the controlling, combating and eliminating of venereal diseases. The fact that there are so many women in our charitable and State institutions today because of venereal diseases proves to us that not only from a standpoint of health but from a standpoint of economics the work must be carried on through the woman as well as through the man.

Woman has been loath to recognize and acknowledge home conditions or those of her community and she has put forth very little effort to

become enlightened. She has been utterly ignorant of the causes of most of her illnesses with which she has come in contact, and this is more true of venereal diseases than any other, partly because of the many names and phases under which they appear. Through the State-wide program she must be made to see and know that venereal diseases are communicable, contagious and infectious. She must be encouraged to put aside the old idea that "it is not my business" and "I just can't talk about such things." To educate her to the larger interpretation of the crying need and opportunity for usefulness to herself, her community and her State is our goal, but unless she can be made to see





that venereal diseases and prostitution are incompatible with a right interpretation of the greatest power of life for happiness, she will not be doing her part. Hence the need for education.

### Education

Ignorance of the laws of life has almost spelled disaster for woman, and this must be overcome. Woman should have an understanding knowledge of life's development and its stages, both as an individual being and as a social being. Hence the laws of society, which should be interpreted as the greater opportunity to attain our ideals in life, home and heaven.

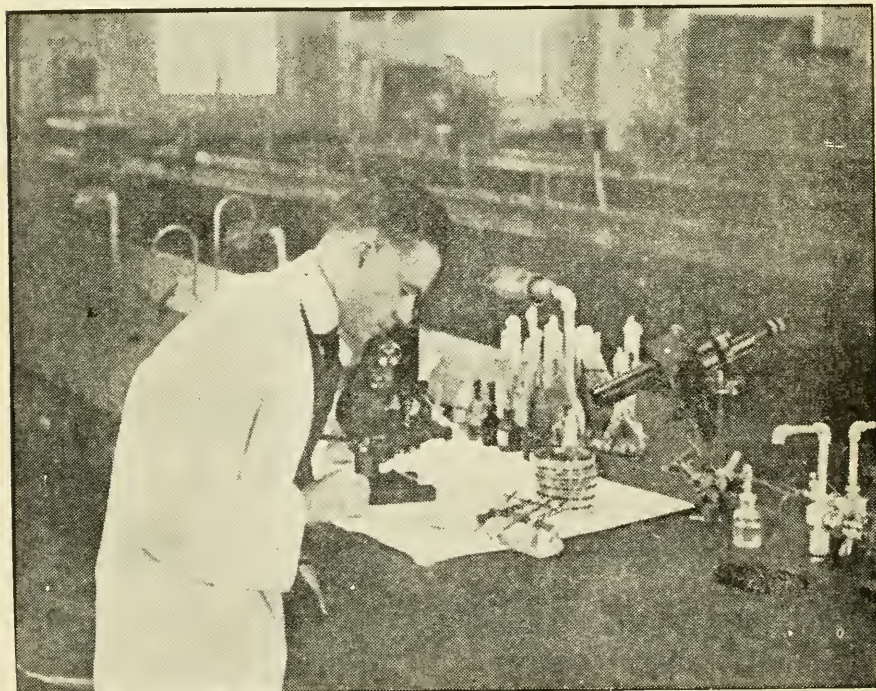
Mothers and teachers are most important factors and the message to them must be clear. To our school girls, our future mothers, it must be

put in such a way as to develop in them the longing for real home atmosphere, care and protection, together with the right aim and ambition for the children that are to come. An understanding of the facts of reproduction and the responsibility of reproduction, with the reason for control of sex impulses in life, are very essential. But facts are not all-sufficient; they should only lead to an understanding of life as an opportunity.

### Methods

We hope to reach every woman and girl over fourteen years of age in the State of North Carolina with a clean, clear sex message. This is to be done through lectures, literature, films and card and slide exhibits.

The National Board of the Young Women's Christian Association has,



### LOOKING FOR THE GERMS OF SYPHILIS

Whenever gonorrhea or syphilis is suspected careful laboratory examinations should be made



as its contribution, loaned to the State for a period of one month five women physicians to carry the message. These women lectured all over the country during the war and had marvelous success.

An intensive campaign covering twenty days was put on through the State Board of Health with splendid results, Dr. Hannah Morris, of New York City, being the lecturer in charge.

Before July 1, 1920, we hope to reach out into the smaller cities and

counties, and in this we are looking forward to further assistance from the Young Women's Christian Association, not only in lecturing but in helping to raise up leaders to assist us in carrying on a permanent work.

The fullest co-operation from Women's Clubs, Parent-teachers Associations, Home Demonstration Agents, Mothers' Clubs, educators and all organized groups as well as individuals is absolutely essential for full success in this campaign.

## VENEREAL DISEASE CAMPAIGN AMONG COLORED PEOPLE IN NORTH CAROLINA

DR. ALDRICH R. BURTON  
U. S. Public Health Service  
and

DR. WALTER J. HUGHES  
N. C. State Board of Health

Whether or not it is advisable to carry out the educational phase of the venereal disease campaign separately among the races, we think, has been definitely decided by the results of the demonstration now being conducted in the State of North Carolina. The campaign, as far as the medical and the law enforcement phases are concerned, must be carried on without reference to race or nationality. It is not a question of who has the higher percentage of infection but rather of stamping out the menace wherever it exists. It is believed that one of the most important factors in diminishing the prevalence of the venereal diseases—gonorrhea and syphilis—is to remove from the mind of every individual the widespread notion that they are trivial and that their effects are evanescent, and to impress them with the gravity, seriousness and lasting effects and fatality of these diseases.

The campaign in North Carolina is no longer in the experimental stage. It was designed and has been carried

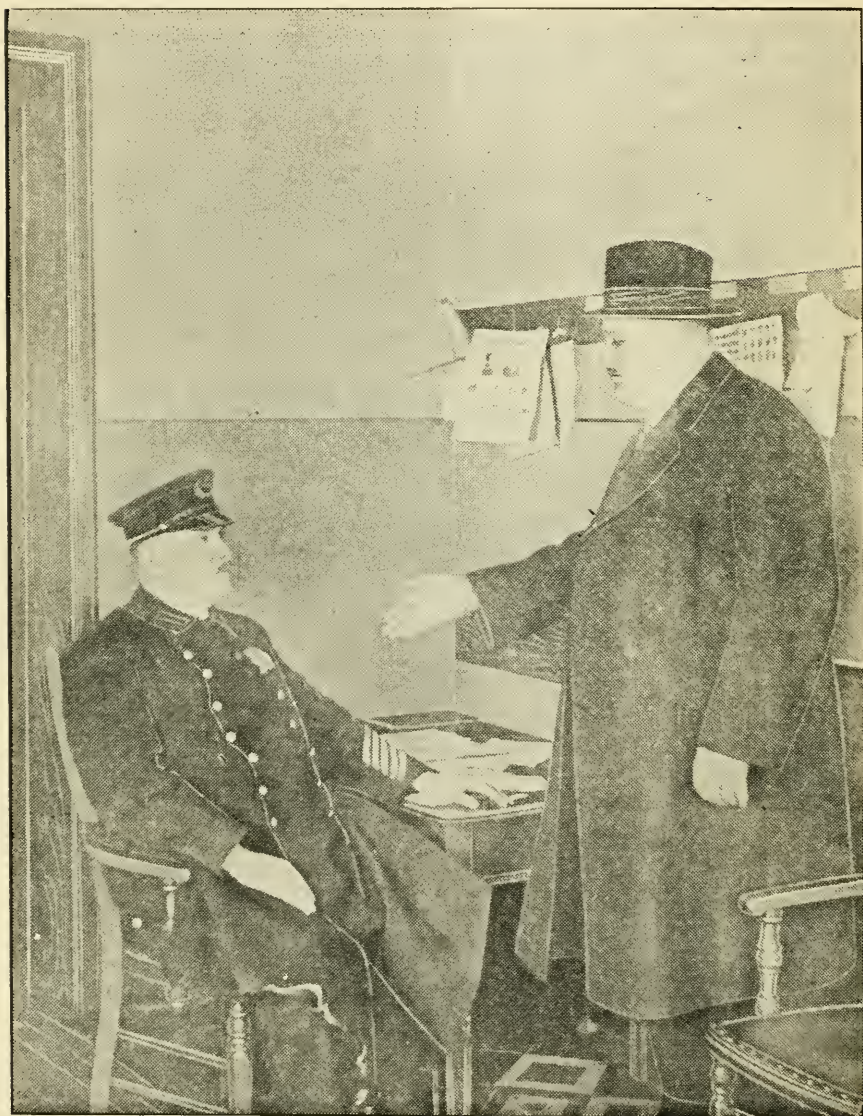
on as a demonstration of what can be done in this particular line. The benefits which eventuated in the army from the publicity and lectures on the venereal disease menace have convinced us that similar results might be expected in dealing with the civilian population.

To do this, as many persons as possible must be reached, and the method which is most forceful and most accessible is the best. In keeping with this idea it was thought that to more effectually reach the colored portion of the population colored physicians should be employed. As Captain Arthur B. Spingarn has said, "they are familiar with race psychology and can make a special appeal to race pride and desire to excel."

Our message to the people consists of a statement and a plea. A statement of the causes, predisposing and direct, course and pathological effects on the individual and his family and the economic effects on the community. A plea for the support of the positive, correcting agencies as

sex education, proper recreational facilities, improved sanitary conditions and for prompt, proper and thorough treatment of all existing cases. It is manifestly impossible to reach every one in the State directly, but we hope to do so indirectly by the use of literature and follow-up work.

It was predicted that the people were not ready for this message, but this has never materialized. It has been very gratifying to find the leaders, with hardly an exception, realizing the necessity for instruction along these lines, and willing and anxious to receive and pass on with zeal any



#### DUTY OF POLICE

Citizens have a right to demand that officials enforce the laws that have been enacted for the suppression of prostitution. This is particularly a police duty



information and to support our efforts in every way. We recognize that lectures are most effective when followed up by organized and permanent effort. This is being done by ministers in their sermons, physicians in private and public talks, colored social workers and welfare organizations.

The plan of the campaign is to reach as many cities as possible, especially where there are clinics, and to meet the leaders en masse, as in church conferences, fraternal organizations, State associations, etc. If the leaders are properly reached it will not be too great a task to mobilize the whole social force of the colored communities. In each city we visit we get in touch with the city and county health officers, colored physicians, teachers, ministers, and hold group meetings with parents and give lectures at schools, churches, lodges, Y. M. C. A., industrial plants, and business and social welfare clubs.

The co-operation of colored ministers should be obtained, for they have an influence and social force in their various communities that is far-reaching. Thus we are able to reach a large majority of colored people through the churches with a message concerning venereal diseases. During November and December we addressed five ministers' conferences embracing a membership of 766 ministers, 573 of these engaged in the active ministry. Through them we have lectured in 48 churches to 7,978 adult persons. The message in all cases was well taken. To use the expression of a woman who attended one of these lectures, "I should have had this message twenty years ago, but I am benefited inasmuch as I can impart it to my children."

The support received from educators is very encouraging. By their aid we have had several group meetings with teachers and covered twenty-three grammar schools, five high schools and eight colleges, reaching in that way 1,279 boys and young

men and 1,745 girls and young women. This work does not cease with a message but is followed up with literature and the organization of clubs.

We recognize the fact that there is a class that cannot be reached either through church, schools, or society. We do, however, get the message to them by going directly to the shops, factories and lumber plants where they are employed. Of the fourteen plants we have visited we have had the co-operation of the authorities, and the interest manifested by them is highly praiseworthy.

The educational work has been highly gratifying and generously received by all. We have had the support of all classes. The medical men have rendered valuable assistance wherever we have gone. The ministers have turned their churches over to us and given us their moral support. The educators have given us space in their classrooms and welcomed the message as a long-needed necessity. During November and December we delivered 124 lectures to a total of 17,590 persons. Much remains to be done, and not until we have given the work enough momentum to be self-propelling and lasting will we consider our part in the work completed.

### FREE PAMPHLETS

The true facts of sex are presented in a wholesome manner and the truth is told about Venereal Diseases in a series of pamphlets issued in six sets, as follows:

Set A. For Young Men.

Set B. For the General Public.

Set C. For Boys.

Set D. For Parents.

Set E. For Girls and Young Women.

Set F. For Educators.

Any of these pamphlets will be sent free upon request.

Address the North Carolina State Board of Health, Raleigh, N. C.



## VENEREAL DISEASE CLINICS IN NORTH CAROLINA

The clinics listed below are operated through coöperative arrangements between the North Carolina State Board of Health, the U. S. Public Health Service, and the local health authorities.

### ASHEVILLE—Third floor Old Library Building.

Daily except Sunday, 9:30–11:00 A.M.  
DR. A. F. TOOLE, Chief of Clinic.  
DR. C. V. REYNOLDS, Health Officer

### CHARLOTTE—Seventh floor Realty Building.

Daily except Sunday, 2:30–5:30 P.M.  
DR. S. R. THOMPSON, Chief of Clinic.  
DR. C. C. HUDSON, Health Officer

### CLINTON—County Health Office, Lee Building.

Saturdays, 1:00–5:00 P.M.  
DR. E. T. HOLLINGSWORTH, Chief of Clinic and Health Officer.

### FAYETTEVILLE—City Hall.

MEN, Monday, Wednesday, and Friday, 7:00 P.M.  
WOMEN, Tuesday, Thursday, and Saturday, 9–11 A.M.  
Arsphenamine to all patients, Friday, 2:00 P.M.  
DR. R. A. ALLGOOD, Chief of Clinic.  
DR. W. C. VERDERY, Health Officer.

### GOLDSBORO—200½ East Walnut Street.

Daily except Sunday, 11–12 A.M., 4–5 and 7–8 P.M.  
DR. RICHARD SPICER, Chief of Clinic.  
H. B. LARNER, Health Officer.

### GREENSBORO—City Hall.

Daily except Sunday, 4–6 P.M.  
DR. D. R. WOLFF, Chief of Clinic.  
DR. B. B. WILLIAMS, Health Officer.

### HIGH POINT—Over Ring Drug Company.

Daily except Sunday, 7–9 P.M.  
DR. T. M. STANTON, Chief of Clinic.  
DR. J. J. MCANNALLY, Health Officer.

### RALEIGH—Wake County Free Clinic, 15 W. South St.

Week days except Thursday, 1:30–3:30 P.M.  
DR. C. O. ABERNATHY, Chief of Clinic.  
DR. PERCY AHRONS, Health Officer.

### ROCKY MOUNT—

DR. H. LEE LARGE, Chief of Clinic and Health Officer.

### WILMINGTON—Courthouse.

Daily except Sunday, 4–6 P.M.  
DR. A. McR. CROUCH, Chief of Clinic.  
DR. CHAS. E. LOW, Health Officer.

### WINSTON-SALEM—Wachovia Bank and Trust Building.

Daily Except Sunday, 4–6 P.M.  
DR. V. M. LONG, Chief of Clinic.  
DR. R. L. CARLTON, Health Officer.

WHAT WE KNOW ABOUT CANCER  
A HANDBOOK FOR THE MEDICAL PROFESSION

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Prepared by a Committee of the  
American Society for the Control of Cancer  
and Published Jointly by the  
American Society for the Control of Cancer  
and the  
Council on Health and Public Instruction of the  
American Medical Association

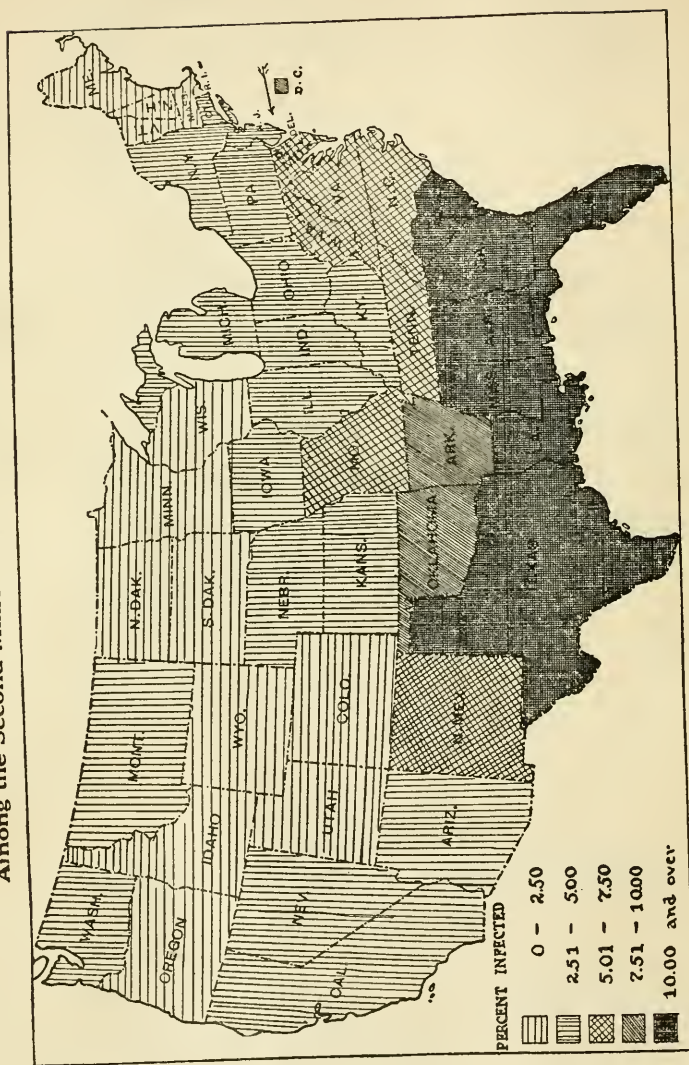
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For Free Distribution by the  
NORTH CAROLINA STATE BOARD OF HEALTH  
RALEIGH, N. C.

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Every Physician in North Carolina Should Have a Copy.  
It Will be Sent Free Upon Request.

Map Showing the Relative Standing of the States in Respect to the Venereal Disease Rate Among the Second Million Men Inducted into the Army.



V. D. Pamphlet No. 30.

Issued by The Treasury Department,  
THE UNITED STATES PUBLIC HEALTH SERVICE,  
228 First St., N. W., Washington, D. C.





# The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

This Bulletin will be sent free to any citizen of the State upon request.

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Vol. XXXV

MARCH, 1920

No. 3



"LET THERE BE LIGHT"

# THE Health Bulletin



PUBLISHED BY THE NORTH CAROLINA STATE BOARD OF HEALTH

Vol. XXXV

MARCH, 1920

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## INTRODUCTION

It is the purpose of this bulletin to trace the principles of excreta disposal from the instinctive tendencies of lower animals through the history of man's conception of improved methods of excreta disposal, up to and including the most modern sewage disposal practices which are being so generally adopted in North Carolina. In the development of this purpose the material in this bulletin is grouped into five articles, as follows: (1) Excreta Disposal and Animal Existence; (2) Development of Excreta Disposal Methods; (3) Privy Sanitation Under the State Board of Health; (4) Sewage Disposal in the Private Home; (5) Sewerage Problem in Towns and Villages.

The methods of excreta disposal recognized and approved by the State Board of Health embrace two general groups: (1) Certain specified types of sanitary privies; (2) Sewerage systems, either public or private, of approved design. In the Bulletin for July, 1919, which was devoted entirely to privies, a rather exhaustive and somewhat technical presentation of this subject was given. It is, therefore, neither necessary nor proper here to repeat the general consideration of privies as factors in excreta disposal. Since the appearance of the Special Privy Bulletin, however, the principles set forth therein have been subjected to the acid test of practicability through the active operation of the State Privy Law since October 1, 1919. A statement of progress and developments under this law rightly belongs in this bulletin, as it will serve to supplement and bring up to date the privy side of the excreta disposal question.

More and more is it being realized by the people of our State that the ultimate goal to strive for in the disposal of human excreta is sewerage systems. It is, therefore, logical and necessary not only to describe the immense enthusiasm shown for sewer construction throughout the State, but to point out the way to success and economy for those who are contemplating installation of either public or private systems.

The second, fourth and fifth articles of this bulletin were prepared by Mr. H. E. Miller, Director of the Bureau of Engineering and Inspection; the first and third were contributed by Dr. K. E. Miller, Director of the Bureau of County Health Work.



## EXCRETA DISPOSAL AND ANIMAL EXISTENCE

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In drafting the plans for the Universe the Supreme Architect provided certain fundamental and never-failing laws by which all animal life must be governed in order to live and flourish, and in disregard of which it must surely die. No animal life can exist without food. When food is consumed by the animal organism it undergoes certain marvelous and obscurely understood chemical changes by which a certain portion of it is absorbed and either transformed into animal heat and energy or stored up in the body as a reservoir of strength, or used to supply the elements of natural growth and development. The remaining portion of food taken into animal bodies has, to say the least, no useful purpose to perform, and so is cast off. Especially such detrimental or poisonous substances as may be separated from the food consumed is denied admission into the animal body, the House Beautiful, which is indeed the earthly dwelling place of the Most High. Not only so, but we find that life and growth is a continuous process of building up and tearing down, the portion torn down being harmful, else it would otherwise be allowed to remain. Moreover, the refuse matter, in the course of its passage through the bodies of higher animals, becomes infested with swarms of germ life, none of which contribute anything to the body's welfare, and in some instances are most dangerous and deadly to its existence. Whatever may be the origin of the various elements of body waste, the purpose is invariably the same, namely, to rid the body of such substances as would otherwise hinder or destroy it.

The Master Mind has not overlooked the means to accomplish this purpose, having provided the lungs, skin, kidneys and intestines, their importance being in the ascending order as named. Our principal concern, therefore, is with the kidney and bowel excretions.

Since Nature has made it imperative that waste matters must be removed from the body, common sense teaches us none the less forcibly that they should never be allowed to reënter in any form. In the lower animals natural instinct operates most potently in this direction, by virtue of that most powerful instinct, self-preservation. Few indeed are the dumb beasts that will be-foul their own habitations if given an opportunity to do otherwise.

Up to this point the human animal obeys the laws of Nature like all other animals. Were he a creature actuated by pure instinct, as other animals, there would be little call for preachments on excreta disposal. But no, he differs from other animals in having a highly developed intellect and rationality. It is his rationality that allows him to drink water contaminated with human excreta, and to eat food bedaubed with fecal matter, carried thither by swarms of carrion-flies. Repulsive as is this plight in which rationality has placed the human animal, it might be tolerated if this were all, but unfortunately it is not. For some obscure reason, man's rationality allows a goodly portion of the race to offer themselves and their helpless babes as needless sacrifices to typhoid fever, dysenteries, and hookworm disease, just as the soldier who aimlessly rears his head above the trenches for a target to the enemy.

The diseases here mentioned are the offspring of human excreta. When disposed of in such a way that no portion of it can gain readmission into the human body, human excreta is absolutely harmless. The fact, however, that we have 500 deaths from typhoid fever, and more than 2,000 deaths from other diarrheal diseases yearly in the State is positive proof that excreta is no small item in the dietary of North Carolina.



Health and life are dependent upon a continuous struggle between the forces that would destroy, and those that would preserve and build up the body. The destructive forces are guided, as it were, by some evil genius which keeps them ever active and alert to perform the works of mischief and accomplish man's downfall. The constructive forces, on the other hand, are guided largely by man's own intellect and will. Herein lies the weak point in man's defensive armor. Man's intellect, the acme of creation, is commonly derelict and incompetent in its guardianship of the temple of the soul. Man consumes human excreta because he has not willed to do otherwise.

Careless disposal of human excreta allows it to be carried by drainage and other factors into the drinking water supply, to be visited by the filthy fly, by which it is in turn carried to articles of food; and again, the scatterment effected by winds, rains, chickens, pigs and other animals impregnates the soil in which green vegetables, such as lettuce, radishes, and the like, are frequently grown. These vegetables are often eaten uncooked and commonly have particles of polluted soil adhering to them when eaten. In these ways human excreta carelessly managed is, during certain seasons of the year, unwittingly, but none the less certainly, an almost constant article of diet.

Assuming that man consumes human excreta by accident, rather than preference, there should be a reasonable assurance that any information towards ways and means of abolishing this noisome custom should receive hearty approbation and universal adoption. The solution of the excreta disposal problem, in brief, consists in the use of either (1) A properly constructed privy in accordance with the plans and specifications prescribed by the State Board of Health (see *The Bulletin*, July, 1919), or (2) a public or private sanitary sewer system. The latter method will be fully discussed in this bulletin.

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## DEVELOPMENT OF EXCRETA DISPOSAL METHODS

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It would be interesting to trace from the remotest antiquity the practices of the human race in respect to the disposal of waste matter from the body. Space, however, does not suffice for this. Our most noteworthy example of this kind is found in the laws laid down by Moses, leaving no doubt that the purpose involved is the protection of the health of his people.

### SEWERS

There are records of sewers in ancient cities, dating as far back as Nineveh and Babylon, in the seventh century before Christ. There is considerable information available regarding the sewers of ancient Jerusalem, and there are many lengthy and detailed discussions of the huge arched masonry conduits used as sewers in Rome in the early stages of its development.

Even the sewers of Rome, however, which were developed in a period fairly recent in comparison to the earlier systems, were of very little sanitary value, except in the abatement of nuisance. They served to rid the city of domestic wastes only in the sense that it was the practice to dump rubbish and filth in the gutters, from which it was washed into the sewers during the periodic flushing of the streets. The recognized system of disposal of excreta and

other domestic wastes at that time, and even much later, was the cesspool. Cesspools were constructed with porous sidewalls and bottom, allowing the liquid sewage to seep away into the surrounding earth. It is recorded that in 1820 the whole subsoil of the city of Paris was on the point of becoming putrid from cesspool filth.

Sanitarians of that period were divided into two schools, one advocating "dry" and the other "water carried" methods of collecting human excreta. The "dry" method consisted in the collection and removal of excreta in pails, while the "water carried" method consisted of flushing into the sewers. In the division of opinion of this period is recognized the basis of development of the two general classifications of excreta disposal methods, privies and sewers, respectively.

The first instance cited in reliable records in which a separate sewer system for the collection and removal of domestic wastes was advocated, was in 1842 by an English engineer. The first notable instance of this kind in this country was in the city of Memphis in 1880. This system, however, owes its notoriety to its defects rather than its virtues. The Raleigh system of separate or sanitary sewers constructed in 1887 was among the very first in this country to operate successfully.

Although the value of sewerage as an indispensable facility for the protection of health in cities and urban communities is now quite generally appreciated, we are forced to recognize that until very recently sewers were used mainly for surface drainage and abatement of nuisance, while cesspools were the common method of disposal of excreta. The last city of consequence in the United States to banish cesspools was Baltimore. While a report of an investigation in 1879 shows 80,000 cesspools in use in the city, with the attendant pollution of 92 per cent of all samples of water examined from sources within the city, no definite action was taken until 1906, when a study of the city was made by engineers, which led to the installation of a comprehensive system of separate sewers and treatment devices. It was not until after modern medical practice demonstrated that many diseases are preventable by proper disposal of disease-bearing human filth that the public health protective value of sewerage began to receive proper recognition. It is a deplorable fact that even the limited sewerage in many towns and villages today owes its existence too often to an appreciation of the comfort and convenience, rather than the public health protection which it affords.

A complete modern system of sewerage consists of a system of sewers for collection of sewage from house drains and conduction of it to a point of discharge, where it passes through treatment and purification devices, varying in character with the amount of purification required. On account of the increasing density of population and growing tendency to obtain drinking water supplies from impounded streams and other surface sources, treatment of sewage has become the rule, rather than the exception.

### PRIVIES

The "dry" method of excreta disposal advocated in contrast to the "water carried" system by one of the two opposing schools of sanitarians over a century ago has received but little attention from that day to this. The first noteworthy attention which was given to this method was less than a decade ago, when the United States Public Health Service began its rural health

campaigns in 1914, which have furnished a basis for other rural sanitation projects. For instance, the International Health Board, recognizing the significance of rural sanitation, is offering financial coöperation to health organizations all over the world, to assist educational campaigns for the construction of privies, and have set aside funds for coöperating in twenty counties in North Carolina alone. Laboratory and practical investigations of various types of privies, promising invaluable information, are being carried on by the U. S. Public Health Service laboratory at Wilmington under the direction of Col. C. W. Styles, an eminent scientist and member of the Federal Board of Excrement Disposal.

The most stupendous impetus ever given modern sanitation was the adoption by the last General Assembly of a State-wide privy law for the prevention of fecal-borne disease from insanitary privies. Already other States, recognizing the enormous value to the protection of health afforded by the action of the North Carolina General Assembly, are planning similar legislation. Thus North Carolina, a pioneer in sewerage, has introduced an entirely new era in privy development, leading the way for all the rest.

It is clearly understood now, however, that the field of the "dry" method, or the privy system, does not encroach upon the field of sewerage, but has its value in the safe disposal of human excreta for rural homes, unsewered villages, and outlying sections of towns and cities inaccessible to sewers. The privy should never be considered as anything but a temporary expedient in any community where sewerage is even a remote possibility.

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## PRIVY SANITATION UNDER DIRECTION OF STATE BOARD OF HEALTH

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### PUBLIC SENTIMENT CREATED STATE PRIVY LAW

In the broader sense, the State Privy Law was not passed at the last meeting of the General Assembly; it was merely ratified at that time. The law has been in the process of passage by the public sentiment of North Carolina for several years. Since we have come to a better understanding of the origin of typhoid fever, dysenteries and hookworm disease, every case of such diseases and every death caused by them have registered silent but unmistakable protests against the continuance of conditions making the ravages of these diseases possible. Likewise, every success that has been scored by health authorities in the prevention of these diseases through improved methods of excreta disposal has spoken in thunder tones demanding that such protective measures be made unanimous throughout the State. Thus the temper of public sentiment in North Carolina is such that the General Assembly could hardly have avoided the adoption of the State Privy Law even had it so desired.

There never has been and never will be any doubt in discerning minds as to the wisdom of the State Privy Law. Only the details of its administration remain the unknown quantity to the public mind. This is necessarily so in view of the fact that in attacking this problem the State Board of Health has been sailing an uncharted sea. The law went into active operation on October 1, 1919, and the experience gained in a practical way is most illuminating.



## RESUME OF PRIVY LAW

The method of procedure has been outlined in the special privy bulletin for July, 1919, a brief résumé of which will here suffice. After a careful and unbiased investigation, the State Board of Health approved five different types of privies which would satisfy the requirements of the State law. These are (1) The Earth Pit; (2) Box and Can with Scavenger Service; (3) L. R. S., or Septic Privy; (4) Vault Type Chemical Privy; (5) Double Compartment Concrete Vault. The merits and demerits of each one of these privy types were stated in such terms that even the humblest intellect could satisfy itself in regard to the type best suited to any given place and circumstance. Not only the principles involved in the operation of the various privies were explained, but also plans and specifications for construction, so that wherever possible an industrious man might be enabled to construct the privy himself, effecting thereby a considerable saving in expense. In addition to proper construction, it was emphasized in particular that lasting benefit could be expected only when proper attention was given to privy upkeep or maintenance. For this purpose suitable directions were given for maintaining successful and satisfactory working conditions.

## PROGRESS SHOWN

In the actual administration of this law the inspectors have met with a gratifying spirit of coöperation from the general public, which is shown from their combined progress report to February 1, 1920.

1. Average number of inspectors on duty during the period, 10.
2. Number of inspections made, 28,997.
3. Number of privies licensed, 9,211.
4. Number of privies given "License Pending" tags, 19,219.
5. Number placarded as "Insanitary and Unlawful to Use," 35.
6. Number compiled, 32. Number still on hand, 0.
7. Number prosecuted, 3.

The number of privies licensed represents those which have already complied with the law in details of construction and maintenance. In view of the short length of time the law has been in operation, this showing is in accord with our highest expectations, and is certain proof that North Carolinians have caught the vision of deliverance from filth-borne pestilence.

It is only to be expected that many homes should fail to come up to the standard requirements upon first inspection. The principal reason for this is the fact that people commonly feel the necessity of specific advice and instructions from the sanitary inspector as to how to proceed, which service they are unable to get until the inspector calls. Various other circumstances are encountered wherein the improvements have not been made, due not to unwillingness or hostility, but to certain assigned reasons which must be given consideration at the first inspection, though not thereafter. Whenever, on first inspection, the inspector is convinced that it is the honest intention of the owner of the privy to proceed to remedy the defects without delay, the owner is given the privilege of paying his privy tax and agreeing to make the necessary change without delay, in lieu of immediate prosecution. The privy is then given a "License Pending" tag in place of being posted "Insanitary and "License Pending" privilege is further proof of the willing attitude of the public.

In contrast to this the very small number of instances where the "Insanitary and Unlawful" sign has been used is most striking, though thoroughly in accord with expectations. In other words, the number of "Insanitary and Unlawful" signs represents the opposition forces, which are manifestly an insignificant minority. In every instance where this placard was used immediate steps were taken toward prosecution. It is, however, a tribute to the good sense and second thought of most of the opposing individuals that all but three adjusted the matter outside of court. The three whom it has been necessary to prosecute thus far are Mr. W. B. May, Durham; Mr. L. Little, Durham; and Rev. A. Schulenburg, China Grove. Distasteful as this duty has been, the State Board of Health is nevertheless indebted to these gentlemen for their resistance, affording thereby ample opportunity for establishing the validity of the privy law.

### LOCAL RESPONSIBILITY

The administration of this law has brought certain facts to the forefront. On first sight, there is a tendency for towns and villages to shift all the responsibility to the State Board of Health. Indeed, the State Board of Health does not decline to assume this responsibility, but does feel called upon to point out the fact that this attitude is very detrimental to the towns and villages themselves. The Attorney-General has submitted a ruling on this subject, stating that the towns not only have the authority to adopt some particular type of approved privy as their standard, but that this course is naturally expected in view of the uniformity and economy effected thereby. The only logical procedure, therefore, is for each town council to determine upon some one type of privy best suited to the local needs and conditions, and then immediately enter into the installation of such privies in all homes requesting this service. All materials and labor should be furnished by the town and the actual cost of the completed job, without profit, be charged to the property owner. In this way the property owner gets the advantage of quantity prices of material and labor, which certainly amount to an enormous saving as compared to the job done in the ordinary way. Furthermore, it relieves the individual of all worries and difficulties attendant upon getting the work done by private contract. Upon placing his order with the town management his part is done, with the exception of paying for the actual cost of the job. In this way the following advantages are gained: (1) Great economy to the individual; (2) a uniform system for the town; (3) much better quality of workmanship; (4) individual relieved of annoyance; (5) community equipped in the shortest possible time.

These services are in the power of every town council to render to their citizens without a cent of expense on the part of the town. Town councils, therefore, owe it to their citizens to take the necessary action.

In small unincorporated villages where no town council exists, similar methods should be instituted by private agreement among groups of leading citizens acting for their mutual financial advantage and personal convenience.

### IMPROVEMENTS IN PRIVY DESIGNS

The wide range of experience by the inspection service, also, has brought forth some good suggestions relative to improvements in certain privy types, though nothing that would in any way affect the specifications for any type. The improvements now under consideration relate to the septic privy and the

vault type chemical privy, looking to greater efficiency in the former and greater economy in the latter. As soon as the value of these changes is sufficiently established the public will be given due notice so that they may profit by them.

With reference to the chemical commode, the writer feels it his duty to modify the recommendations concerning this device given in the Bulletin of July, 1919. Certain administrative reasons made it necessary to place rigid restrictions upon the use of the chemical commode. Experience, however, has shown that certain concessions are justifiable. We are now in a position to give a rather strong endorsement to the chemical commode, provided it is installed and used inside the house. They cannot, however, be approved for use in any outbuilding. The regulations covering the chemical commode in the Bulletin for July last specified the use of caustic chemical as essential. On account of the danger of occasional burns from the splash of chemical upon the skin, we take this opportunity to recede from this requirement, and, instead, to recommend the use of such noncaustic coal tar chemicals as furnished by the chemical commode manufacturers, or otherwise obtainable.

### PRIVY BUILDING IN RURAL DISTRICTS

The tremendous advances that are being made throughout the State in towns and villages in consequence of the State Privy Law should be realized in similar degree in the rural districts not coming under the requirements of this law. We do not like to think that the people are responding so universally because they are made to do it. Indeed, our experience is quite the opposite. With few exceptions, the people are seeking to find out what is the thing they should do, and how to do it, rather than means of evading the requirements. Since we find the people in towns and villages so readily taking hold of measures for their health and safety, we are justified in assuming that those in the rural districts have a similar appreciation for self-preservation. Since we believe that the results obtained in better methods of excreta disposal are due more to information than to legislation, and since the necessary information to show the why and how of such methods is being adequately supplied by the State Board of Health, we are encouraged to look forward to a widespread popular move for better sanitation on the farm as well as in the towns and villages.

### NO PRIVY SO GOOD AS SEWER

Though a goodly portion of the discussion of improved methods of excreta disposal is devoted to privies, it is not the purpose to place undue emphasis on the privy as an ultimate goal. There is no privy without its defects, and there is none whose efficiency and convenience can compete with the properly constructed and operated sewer system, either public or private. In fact, the most outstanding result of the State Privy Law has been and will continue to be the impetus it has given to sewer building in North Carolina. As will be shown in another article in this Bulletin, there has sprung up a veritable epidemic of sewer building in the State, involving practically every town where sewer construction is even a remote possibility. Hand in hand with this goes the improvement of drinking water supplies by means of public water systems, which constitutes another sanitary reform of first-rate importance.



# SEWAGE DISPOSAL IN THE PRIVATE HOME

## MORE EFFECTIVE METHODS OF EXCRETA DISPOSAL PAY

For many years more thought and attention have been given to raising better crops and better stock than was given to raising a better and healthier people. In many instances hog pens and stables have been constructed with well-drained concrete floors, and maintained in a most sanitary manner—all filth being cleaned out regularly and hauled away—while on the same premises might be found an open surface privy. Improved conditions of stock raising were brought about as an economic necessity, because the loss of a hog or a cow, or the production of an inferior grade of stock, can be readily and keenly realized as an economic loss. The thing we have been slower to realize, but now have come to see plainly, is that many deaths and cases of sickness are absolutely preventable if the proper precautions are taken in the sanitation of the home and its surroundings. The most important of these is the safe and sanitary disposal of the human excrement. This can be accomplished by the application of one of three methods:

1. An approved type of privy.
2. A private sewage disposal plant.
3. Connection to public sewer system.

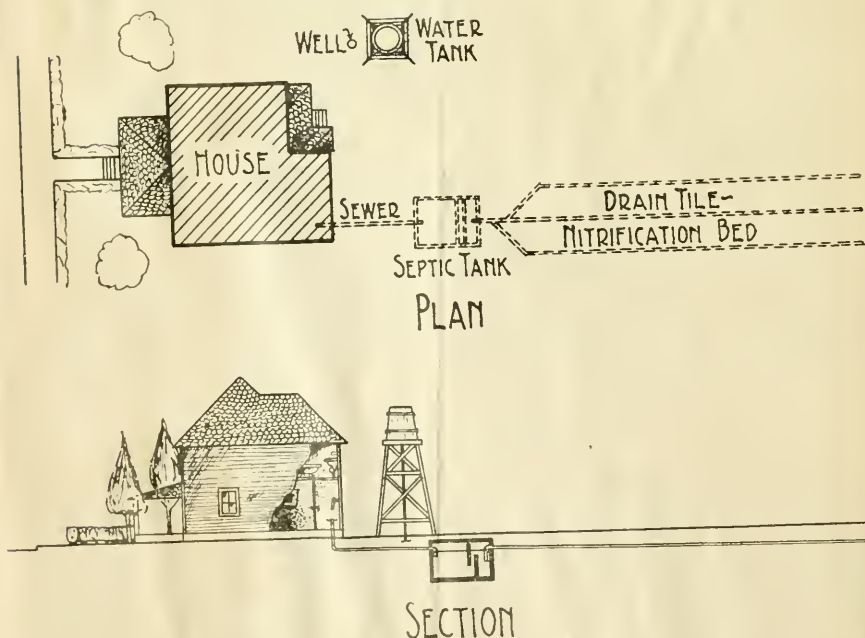


Fig. 1

### SIMPLE AND INEXPENSIVE SEWAGE DISPOSAL SYSTEM FOR A RESIDENCE

The plan shown here outlines disposal by means of septic tank and subsurface tiling for distribution of the settled sewage.

Locate the tank conveniently to the house from 25' to 50' when possible. By so doing stoppages common in long sewer lines may be greatly reduced.

Locate the tile distribution system in the garden if possible.

## REASON FOR ADOPTING PRIVATE SEWAGE DISPOSAL

Since the majority of our population is rural, the choice rests more often between a privy or private sewage disposal plant. A gratifyingly increasing number of people are installing private sewer systems. By so doing, the problem is solved permanently. Besides being a safe and satisfactory method of disposal of the human excreta, all modern sanitary conveniences equal to those of any city home can be obtained. Our development has come to the point where the majority of the people of rural sections are no longer satisfied to use the outdoor privy, no matter how effective, but demand the modern convenience of inside flush toilets, bath and running water. On account of this fact the State Board of Health receives daily many requests for plans and instructions for the installation of private sewerage systems.

## NECESSITY OF SIMPLE DEVICES

The majority of the appliances for sewage disposal systems outlined and described in the various bulletins and books published throughout the country on home sanitation are so complicated and expensive of construction that the average person hesitates to undertake the task. It is the purpose of the State Board of Health, therefore, to outline in this Bulletin a type of sewage treatment plant which is simple and inexpensive of construction, and thus make it possible for the average home in rural sections and unsewered portions of towns and cities to provide themselves with these conveniences.

## SEWAGE TREATMENT PLANT

Ordinary domestic sewage consists of feces, urine, soap, waste water and kitchen wastes. In contrast to the popular conception, sewage is a very dilute liquid. Assuming the average daily body excretion to be three pints of urine and one pint of feces, and assuming the average daily flow of sewage from all sources to be fifty gallons per person, the sewage would contain only one-fourth of one per cent of feces and three-fourths of one per cent of urine. Insignificant as one-fourth per cent of feces and three-fourths per cent of urine in domestic sewage may seem, the sewage is no less a nuisance and menace to health if there is not proper disposition made of it. Fresh sewage has but very little odor, but if allowed to stand untreated it very rapidly decomposes and becomes offensive. The forces of nature which bring about this objectionable condition are the very agencies which are utilized in the septic tank to aid in purification. The principle of septic tank construction is based upon the liquefying action of certain bacteria in surroundings suitable for their growth and activity. When fecal matter is deposited into water in certain proportions, and provision made for suitable length of storage therein, there is developed a growth of liquefying bacteria which convert the major portion of the sewage solids into liquid state. The action taking place in a septic tank, therefore, is twofold:

1. **Sedimentation:** Practically all of the solid matter, except very fine particles, settles out in the tank.

2. **Liquefaction:** The septic or liquefying action taking place in the tank reduces the major portion of this solid matter, settled out and retained in the tank, to liquid state. The remaining unliquefied residue, or sludge, is

an entirely changed, granular, inoffensive, substance which remains in the bottom of the tank. This collection of sludge should be removed when it accumulates to such an extent that sludge particles begin to pass out with the sewage effluent into the soil distribution system. Along with the removal and liquefaction of the solid matter taking place in the tank there is a certain degree of purification effected. The purification accomplished, however, is not complete. Final and complete purification is the function of the soil distribution system.

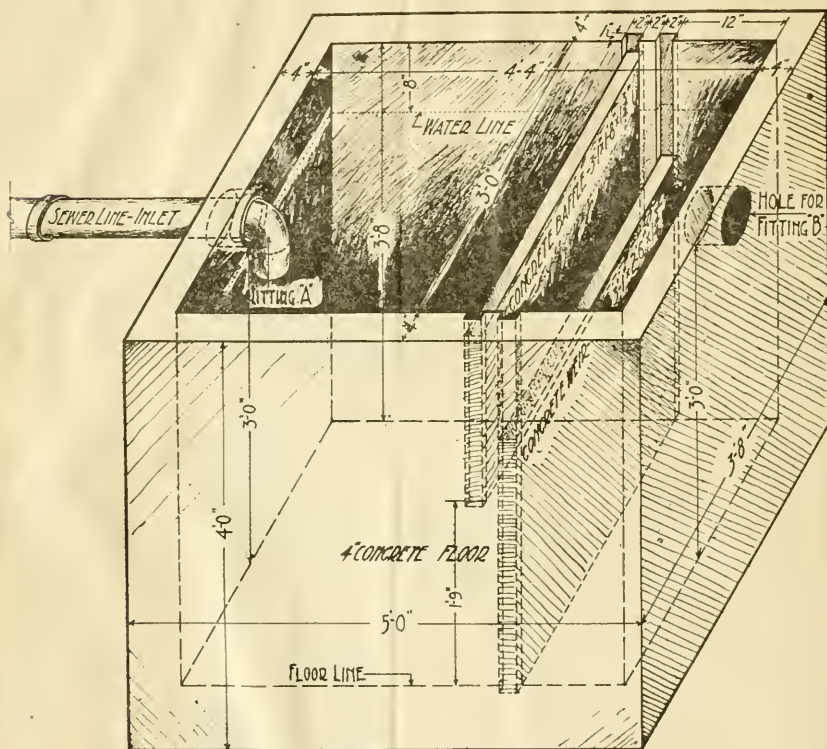


Fig. 2

#### SEPTIC TANK FOR RESIDENCE

Holes are to be cast in end walls of tank to receive fittings "A" and "B." These holes are 6" in diameter and the bottoms of the holes are 3' 0" above the floor of the tank.

Inlet fitting "A," which is a 4" cast iron  $\frac{1}{4}$  bend, is then cemented in place as shown, and the sewer line from the house is connected to this bend.

Outlet fitting "B," which is a 4" x 12" cast iron bend, is similarly placed in the opposite end of the tank, and to it is connected the tile, which extends to the drainage or nitrification bed.

#### SOIL DISTRIBUTION OR SUBSURFACE IRRIGATION

It is a well-known and established fact that the purifying power of the soil is due to nitrifying bacteria commonly associated with plant life. Since these bacteria require air to sustain life, they abound in great quantities in the



surface soil and decrease rapidly in number at succeeding depths, remote from the penetration of air and plant roots, disappearing entirely at from three to four feet below the ground surface. The purification effected, therefore, is in direct proportion to the quantity of nitrifying bacteria encountered. For this

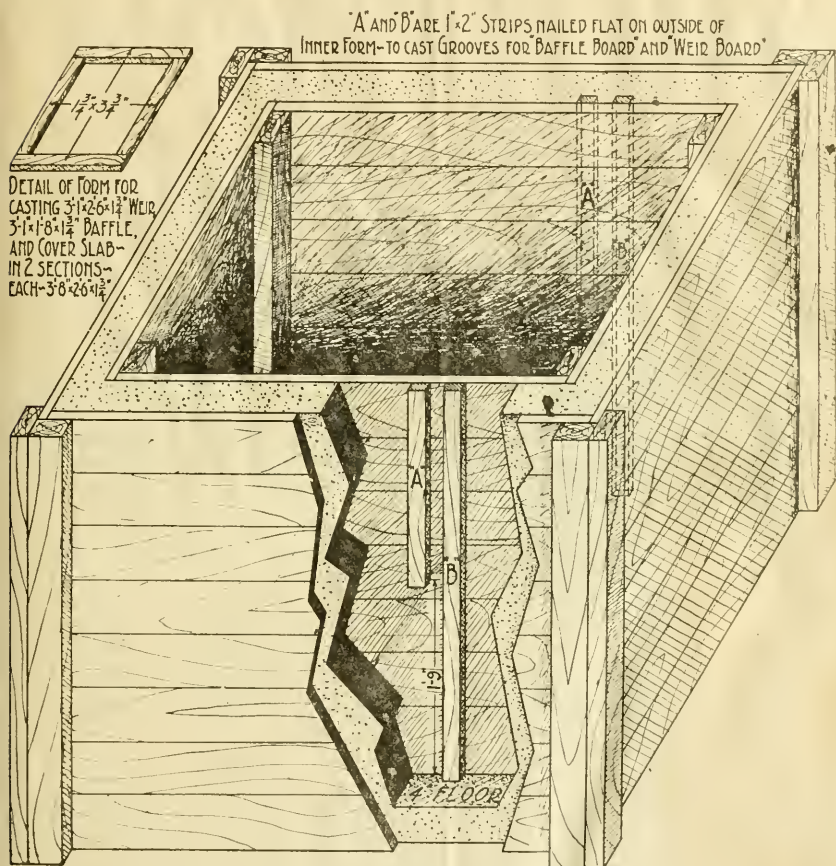


Fig. 3

FORMS IN PLACE. Bottom and sidewalls of concrete, septic tank poured. Also showing form in upper left-hand corner to be used for molding slabs.

**DIRECTIONS FOR CONSTRUCTION OF TANK:** In Fig. 2 is shown a septic tank designed for home construction. The tank is simply a rectangular concrete box provided with baffleboard, weir and overflow, constructed in a pit dug to the proper dimensions.

To build this tank, first dig a hole 5' 6" long, 4' 0" wide and 4' deep, if the top of the tank is to be flush with ground surface. Then mix and pour a 4" layer of concrete in bottom of hole for the floor. After this concrete has become set, roughen a 4" strip all the way around the edge, to give bond between floor and sidewalls. Place forms and pour sidewalls, as shown in Fig. 3. Cleats A, Fig. 3, are nailed to sides of forms, 16" from outlet end, to make grooves in walls for placing of baffles, as shown in Fig. 2. Cleats B are nailed to the sides of forms 12" from the outlet end to make grooves for placing weir. Concrete should be mixed in proportions of one part of cement to four parts of sand and gravel. To form cover slabs, baffle and weir, make a frame of 1 3/4" x 3 3/4" planks laid flat side on a floor or other smooth level surface adjusted to the following dimensions: Weir 3' 1" x 2' 6"; baffle 3' 1" x 1' 8" cover slab, 2 sections each, 3' 8" x 2' 6". Each slab should be reinforced by small iron rods or woven wire. When slabs have hardened sufficiently to handle, remove inner forms from the tank and place the weir and baffle slabs in their respective grooves, as shown in Fig. 2. Waterproof the tank by applying to the entire inside surface a soupy mixture of cement and water, with a large paint brush. When inlet and outlet pipes have been properly connected up place cover slabs. The tank is then ready to be placed in operation.

reason the subsurface distribution lines are laid as near the ground surface as is consistent with protection of the tile. In order to facilitate distribution and absorption of the sewage effluent, the tile is usually laid in a bed of cinders or coarse gravel, not less than six or eight inches in depth, extending the full width of a two-foot trench. In very sandy soil the filter bed may be omitted. For best results the top of the tile should be not more than twelve inches below the surface.

### CESSPOOLS PROHIBITED

A cesspool, however, in direct contrast to the principles above outlined, discharges raw untreated sewage into the earth at the bottom of an eight or ten-foot hole at a depth considerably below where any nitrifying bacteria are found. The liquid portion of the sewage, therefore, seeps away in a dangerous unpurified form, often coming in direct contact with the water-bearing strata penetrated by wells. Even some instances are known where old wells have been used for cesspools. This practice is most dangerous of all, since the raw sewage is discharged directly into the water-bearing strata from which the wells of the vicinity derive their supply of water. The use of cesspools of any kind endangers the public health, and is therefore prohibited by law.

A sewage disposal plant constructed in accordance with the directions given will be found adaptable to conditions of the average home in unsewered communities and can be installed at a reasonable expense.

### TYPHOID FEVER

	Death rate per 100,000 troops or population.	Actual No. men lost.
1. 1898, Spanish-American War.....	1,400.0	2,100
2. 1918-1919, World War, A. E. F.....	7.7	154
3. 1918-1919, World War, Home Troops.....	2.5	50
4. 1916 (latest statistics), general civilian population, U. S.....	13.3	13,500
5. 1918, civilian population, North Carolina..	18.6	549

Had the same death rate from typhoid prevailed among our troops in the World War as in 1898 we would have lost 56,000 men from this cause (based upon presence of 4 million men in service). Our actual loss was 204, or a saving of 55,796 men. The civilian population in whose midst our home troops were quartered in various sections of the country, died more than five times as fast from typhoid fever as the men in the camps, and North Carolinians during the same period died more than seven times as fast.

*Two factors are responsible for the above differences:*

1. **SANITATION or PROPER EXCRETA DISPOSAL**
2. **VACCINATION AGAINST TYPHOID FEVER**

# SEWERAGE PROBLEM IN TOWNS AND VILLAGES

## PHENOMENAL ADVANCES IN SEWER BUILDING

The sewerage development now taking place in over sixty towns in North Carolina is truly phenomenal. Towns that have never before considered it possible for them to have water and sewerage facilities are now undertaking the construction of complete sewerage systems, involving in many cases the installation of a public water supply as well. As much sewerage improvement is being undertaken this year as would ordinarily have occurred in ten years. Compared with former practice, the most remarkable feature of the whole situation is that in many instances small towns of less than 1,500 inhabitants are constructing complete sewerage systems that will make such facilities accessible for practically every home, while the larger towns are extending present incomplete systems to the same extent.

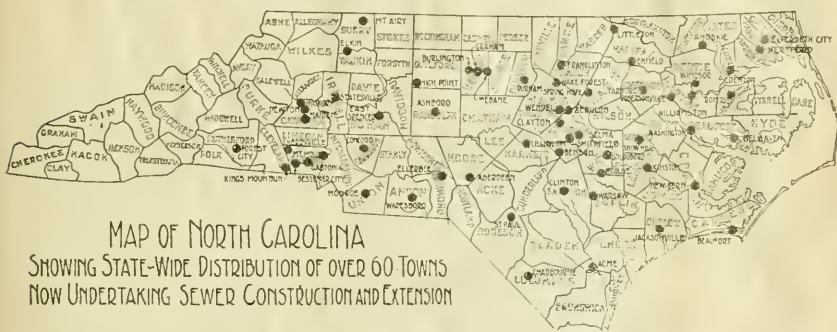


Fig. 4

### STATE-WIDE DISTRIBUTION OF SEWER CONSTRUCTION

It is estimated that fifteen thousand privies will be replaced by sewer connections as a result of the sewer construction taking place in the towns shown on the above map.

### PUBLIC HEALTH VALUE OF SEWERAGE

The old idea of providing sewerage only for the business sections and more congested areas of the larger towns, chiefly for convenience and abatement of nuisance, is now forced to give way before the present tide of sewer construction sweeping over the State, to a realization of the health protection value of adequate sewerage, which is exercising a predominant influence in this development.

This is the most remarkable instance of universal sewerage improvement of which we have any knowledge. Moreover, this comes in response to a public demand, not merely for convenience and civic improvement, but for the health protection afforded by the proper disposal of human excreta. It demonstrates that North Carolinians appreciate the value of such protection as a business proposition and are willing to pay for it.

### A NEW ERA DAWNS

Thus we have grasped the significance of the economic value and importance of public health measures in which public water supplies and sewerage systems play an important part. Having caught the vision of the financial saving



which may be accomplished by the prevention of avoidable cases of sickness and loss of life from typhoid fever, dysenteries, hookworm and other human filth diseases, we have risen to a new era, in which the protective value of sewerage and other health measures can be computed in terms of money saved, a standard which can be recognized by all.

### THE TOWN'S RESPONSIBILITY

The many devices for final disposal and treatment of sewage, and the plans by which the laying of any particular sewer system is to be governed, are purely technical matters and have no place in this discussion. The sewerage system of each community is a separate problem in itself, the proper solution of which involves investigations, surveys, and studies leading to the drafting of detailed plans for construction. Estimates of cost for different layouts must be balanced against the practical values and sanitary improvement each might be expected to afford.

If the State Board of Health were to undertake to render such service, the work involved would necessitate an expenditure and a force of engineers for which the means available are insufficient to provide, even though it were practical and proper to do so. It becomes, therefore, the obligation of the mayor and board of aldermen, the custodians of the public purse and welfare to select an engineer capable and competent to solve the sewerage problems in accordance with best engineering practice. This important duty, however small the town, should not be delegated to the ordinary land surveyor, who is rarely if ever qualified through training and experience.

### THE FUNCTION OF THE STATE BOARD OF HEALTH

The vital function of the State Board of Health, however, in relation to such matters is to exercise control over public water supplies and sewage disposal facilities, for the protection of health. It is unlawful to let a contract for the construction of either a public water supply or a sewerage system unless the source of water supply and method of disposal of sewage shall have been approved by the State Board of Health. It should be remembered, therefore, that in passing upon plans for proposed water and sewerage systems the State Board of Health approves only the source of water supply and the sewage disposal contemplated, insofar as they relate to the health of the community.

### HOW TO RAISE MONEY FOR A NEW AUTOMOBILE

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First invest in a sanitary privy. The money you will save by this means on sickness in your family this year will more than likely be sufficient; if not this year, then certainly the next.



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Booklet "*Infant Care*" (to births reported).

Special Bulletin No. 177, "*Cornerstone of a Child's Future*" (giving feeding instructions under two years of age).

Special Bulletin No. 167, "*Child of Pre-School Age*" (2 to 6 years).

Special Bulletin No. 50, "*How to Keep Your Baby Well.*"

Weight Charts, up to 7 years of age.

"What is Malnutrition?" (Booklet, Federal Children's Bureau).

"Care of the Mother"

"Is Your Child's Birth Recorded?"

"Breast Feeding"

"Milk"

"What Do Growing Children Need?"

} Dodgers, Federal Children's Bureau.

Syllabus for "*Little Mothers' Leagues*" [For Graduate Nurses]

## GOOD BOOKS AND PAMPHLETS ON CHILD CARE

### MOTHERS

Why Not Make a Study of Your Profession?

#### *The Mother:*

The Prospective Mother  
Prenatal Care

#### *The Baby:*

Infant Feeding  
Care and Feeding of Children  
Short Talks With Young Mothers  
Care and Feeding of Infants and Children  
How to Take Care of the Baby  
Infant Care

#### *The Child:*

His Nature and Nurture  
Dietary for Children  
Food for Young Children  
School Lunches  
What to Feed the Children  
Hygiene of the School Child  
Child Care

#### *General:*

American Red Cross text-book  
Home Hygiene and Care of the Sick  
Milk, the Indispensable Food for Children  
Feeding the Family

The Bureau of Public Health Nursing and Infant Hygiene will furnish names of publishers of above upon request.



## FAITH CURE AND THE QUARANTINE

The Faith Cure People have for a long time been the Ishmaelites of the Church. They were ridiculed and ostracized, and they in turn gave a "*quid pro quo*." Recently, however, they have reason to be encouraged, because their number is increasing. It is true that we hear of no espousal of their faith that would give them a standing in the courts of the temple, yet practically there have been numbers added, though it may be an unconscious acceptance of their views. The closing of the temple on account of the influenza has brought forth some expressions of opinion that amounts to belief in faith cure, pure and simple.

The faith cure people discard the use of means in sickness on the ground that if you trust the Lord without using means He will honor your faith by healing your diseases. The danger of this doctrine has always been not only its plausibility, but its appearance of piety—that was calculated to deceive the very elect.

These modern Faith Curists, however, were not the originators of this view. In our Lord's day the devil advanced the same idea. He tempted Jesus to cast Himself down from the pinnacle of the temple on the plea that God would save Him, according to Scripture.

Here was a discarding of the use of means and shutting God up, either to allow His power to be exercised at the option of Satan, or else to allow

the Son of Man to be crushed to death by the fall. When our Saviour answered "Thou shalt not tempt the Lord thy God," He meant that you have no right to place God in such a dilemma.

When pious men, even with the best intentions, insist that meeting in church when disease is abroad would be harmless, because the Lord would take care of His own, they are really placing God in the dilemma, and in that respect they are "Faith Curists."

We do not for a moment question the piety of these brethren. In fact, we confess that they have more religion than we have, but we do get a grain of comfort from the thought that our religion, short weight though it be, is at least of a more practical nature, and one that will appeal more to the common sense of mankind.

As we study God's dealings with men, we find that He acts according to natural laws, as far as those laws will go, and that it is only when He reaches the end of these laws that He interposes with miraculous power. We believe that He could easily make those who assemble within a church during time of pestilence immune from disease if there were no natural means of attaining the same end, but as quarantine has been proven to be such a means, we believe that He expects us to use it.

Statistics prove that this disease has been no respecter of persons, that both

good and bad have been taken, and that those who did recover from it were those who used the means.

Let us remember that there is a law of parsimony in God's exercise of power as well as in philosophy, and that He never uses supernatural power

when it can be avoided. No one questions the motive of our brethren who hold other views than these. They are good and pious people. "They have a zeal of God, but not according to knowledge."—*From the Presbyterian Standard.*

## AMERICAN PUBLIC HEALTH ASSOCIATION TO CELEBRATE FIFTIETH ANNIVERSARY

Next year the American Public Health Association will conduct its 50th annual meeting. An interesting circumstance is that Dr. Stephen Smith, the founder and first president of the association, will at that time be approaching his 99th birthday. Dr. Smith is still hale and hearty and possesses his faculties to a remarkable degree. It is his intention to read a paper at the meeting referred to. His vigor at a ripe old age exemplifies the results of sane living.

The American Public Health Association was founded at New York City in 1872. Until a few years ago it remained a strictly scientific body, somewhat on the order of the royal societies of Europe. More recently the membership has been broadened so that those may join who have a more general interest in public health, including such workers as health officers, laboratory men, school medical inspectors, in-

dustrial hygienists, public health nurses, physicians interested in preventive medicine, etc.

Dr. W. S. Rankin, Raleigh, is chairman of the committee on membership for the State of North Carolina. Those interested in the objects of the association are invited to correspond with him.

Members of the Association receive the American Journal of Public Health and the A. P. H. A. News Letter monthly, together with the customary association advantages. Dues are \$5 per year.

The American Public Health Association stands as an honored institution which during the years has been tremendously influential in bringing the new methods of public health into use. Certainly no health worker can afford not to be a member, or to miss its publications.

## THE THREE FATES

By W. S. RANKIN, M.D.

In the old days of mythology the length and fullness of life was determined by Jove, who, advised by Themis (Law) sitting at his side, issued his decrees which were executed by the daughters of Themis—the three Fates, who were named Clotho, Lachesis, and Atropos. Clotho is depicted as spinning the thread of life, determining the quality of its fiber; Lachesis as holding

the thread, and measuring it off; and Atropos with scissors as clipping it.

Today, as of old, life is terminated by Divine decree and in accordance with law; the fatal decree is executed by the three daughters of law, whose modern names are Stock, Society, and Self—the three S's. Stock spins the thread of life and determines the quality of its fiber; Society holds it





### THE THREE FATES

and influences the length of its days; Self clips it.

In the olden days man had little control over the Fates. They were deaf to his pleas; but today, after thousands of years, man is beginning to come into his dominion, into that dominion to

which he was commissioned on the day of his creation when the Creator said, "Let them have dominion . . . over all the earth. . . ." Man in the beginning was largely under Themis, under natural law, but as he has assumed his primary and Divine com-



mission he has become more and more the lord of nature, over natural law, exercising dominion. Today he directs the Fates, or bows to their decree only as a penalty for ignorance and carelessness. The ancient Clotho, or the modern Stock, is more responsive to Burbank than to Jove, and obeys any intelligent farmer who exercises his judgment in the selection of seed for his farm or garden, or who produces, according to his design and order, the kind of horses and cows and sheep and chickens which suit his pleasure. The more intelligent and farsighted are now dictating to Stock what their children and grandchildren and great-grandchildren shall be; and the flock will sooner or later follow their leaders. Lachesis, or Society, holding the thread of life within her hands, no longer hears Jove, but listens to Pasteur, Berring, and Gorgas and to those agencies of man which their work has created. Atropos, or Self, for thousands of intelligent lives no longer clips the thread, but withholds the scissors till the thread for its full length is woven into the vesture of many colors and without a seam.

The three Fates are not equally responsive to man's will. Stock is under the individual's control only with respect to the life of the future. Stock is an insurance policy in which one invests for his children and grandchildren; or, it is like a long-term investment with an exceptionally generous rate of interest, both principal and interest being guaranteed by the strongest of all governments. Society is under man's control in proportion to the number of shares of stock which he owns. If he is a poor man—poor in spirit, not necessarily in worldly possessions—and neither has nor takes any interest in Society, if, in short, he wraps his one talent in a single package of epidermis, he will have no influence or control over Society. Self is more directly and to a larger extent under the control of the individual than either of the other Fates. Regardless

of the kind of thread which Stock furnishes, and regardless of its wear as it slips through the intricate machinery of modern Society, Self may add much to the length and fullness of days; for after all we must remember that Atropos, or Self, is the Fate that holds the scissors.

### Personal Hygiene

The part of Self in the protection, and no less but more, in the promotion of health, constitutes the subject of personal hygiene. Personal hygiene will be observed or neglected according to one's appreciation of what its end-product (health) really is. Few of us have a clear conception of the basic relation of health to achievement. The average man conceives health as a condition that permits a person to be out of bed and about his business; the gross distinction is the difference between the horizontal and the perpendicular position of the body.

To appreciate just what health is we must conceive it, not in the abstract, but in the relations in which we find it under actual conditions. For example, one cuts his finger; he has not realized until then the meaning of a whole and healthy hand; the injury, through the discomfort and inconvenience which it causes, brings about an appreciation of health, in a minor way, which before did not exist. The young person in the fullness of life, but with empty purse, passes the wealthiest man in town on the street and envies him. Will he exchange places with the millionaire? Will he give his years and his opportunity and his capacity for enjoyment and take the sixty-five years, the hardened arteries, and the *arcus senilis* of the man of wealth? Health and life are not for sale at any price. A true appreciation of health depends, as we have said, upon seeing the condition in its true relations. To do this we must take a typical or average population group large enough to include all varieties of physical existence as these occur in real life. Just

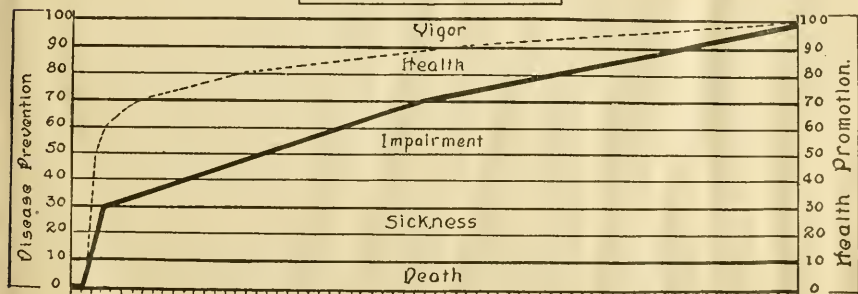
as the merchant selects a typical sample from a bale of cotton in order to determine the quality of the entire bale, so we shall select a typical sample of the population in order to visualize health in its relation to vigor on the one hand and disease on the other. Such a group will consist of seventy-one members; it will be a composite group made up of the races, sexes, ages, and varieties of vitality as these exist generally.

The following diagram serves to spread out and visualize this typical group of seventy-one. The diagram is seventy-one inches long. Each inch represents an individual. The heavy dark line passing from the lower left-hand corner to the upper right-hand corner of the chart is the social life-line on which the seventy-one members are suspended at various levels of vitality, the portion of the line immediately above the inch on the base line corresponding to the physical level of the individual which the inch of base line represents. One person out of every seventy-one dies each year. This person is the lower left hand of the social life-line, at zero vitality. One person in the group is healthier and more physically perfect than any other member. This person is represented by the upper right-hand end of the line. The other sixty-nine are suspended at the various levels of vitality which lie between these two extremes, as indicated by the social life-line. To par-

ticularize: the first inch, the social life-line at zero, represents the person who dies each year; the next two inches, lying between zero and the thirty per cent levels, the two persons in the average group of seventy-one who are in bed all the time; the next thirty inches, lying between the thirty and seventy per cent levels, the thirty persons whose health and efficiency are impaired, persons whose health ranges all the way from the one who is "just able to be up and about" to the one "not quite up to the scratch"; the next twenty-five inches, lying between the seventy and ninety per cent levels, represents a group of persons that we call healthy; the last thirteen inches, lying above the ninety per cent level, represents the vigorous members of society, those who have a feeling of exhilaration, who pursue their tasks with enthusiasm, who are cheerful, who live on the heights, whose lives are dynamic with the inspiration of lofty views and high ideals.

The vital level at which a person lives has much to do with that person's attitude toward life, with that person's reactions to his surroundings. Life is nothing more than a series of reactions to stimuli, physical, chemical, and spiritual. The difference between a dead body and a living body is that one does not react to stimuli and the other does. That's all. Those that are nearly dead react feebly; those that are most alive react strongly; moreover,

The Social Life Line.



those who are most alive are sensitive to stimuli of a fine or delicate quality which are not perceptible to those who live feebly.

Now the finest stimulus to which life reacts is inspiration. Aspiration, idealism, determination and persistence in the attainment of noble ends are our reactions to inspiration. Inspiration is conditioned to a very large extent upon health, that is, physical perfection. It always has been so. "And the Lord God formed man of the dust of the ground and he breathed into his nostrils the breath of life, and man became a living soul." The imperfect clay form was not inspired. When it was perfect in every cell and atom, then followed inspiration. Physical perfection conditioned spiritual growth, and so health is the ordained means for growth in body, mind and spirit.

Just outside of Washington, near Arlington, there are three very high steel towers. These towers were made very high in order to catch the ether waves with their wireless messages that have traveled long distances, that have come from the ends of the earth. These long distance waves are so high above the earth as to resist the magnetic attraction to which waves at lower levels, the short distance waves, yield. So with those who live on the

heights of being, they hear the whisperings from afar. They are sensitive to impulses which the earth cannot claim. They are in touch with and react to the higher stimuli.

After one gains this high conception of health one thing more is necessary: he must learn those natural laws that govern health. The natural laws, remember, are not enactments of medical societies, or legislatures, or congresses. They and the Decalogue have the same Author. Therefore, Louis Agassiz was right in saying that a natural law was as sacred as a moral principle.

Beginning with this issue of the Bulletin there will appear each month a short article on the subject of personal hygiene. Under this subject we shall attempt to point out the part that Self may play in the maintenance and improvement of health. The articles will be so related as to cover systematically the entire subject. The needs and viewpoint of the average lay reader will govern in their preparation, his vocabulary will be used and scientific provincialisms excluded. In the next issue we shall take up the subject of ventilation or the use of air, including heating. Then will follow articles dealing with nutrition and foods, clothing, exercise, rest, recreation, the hygiene of sex, etc.

## INSANITARY CONDITIONS THAT AFFECT THE BABY

1. Open privy.
2. Flies.
3. Dirt.
4. Unclean milk.
5. Clean milk which has been allowed to remain at about fifty degrees and develop germs.
6. Bottles and nipples improperly kept.
7. Pacifiers.
8. Baby crawling about room picking up dirty objects.
9. Unboiled water.
10. Lack of drinking water.
11. Handling the baby by persons with unclean hands.
12. Kissing, or handling the baby when you have a cold.
13. Diapers not properly washed.

These are conditions which bring on "summer complaint" or diarrheal conditions, from which a majority of babies in North Carolina die.



## PUBLIC HEALTH NURSING

BY JANE VAN DEVREDE,

*Director Nursing Service, Southern Division, American Red Cross*

Public Health Nursing has been fostered by the Red Cross for a number of years. The recognition of the needs of small towns and rural communities resulted in the establishment of the Town and Country Nursing Service, which undertook to prepare nurses for such work; to assist communities to secure their services; to give them consultation and supervision without assuming local financial responsibility. The extension of this service necessarily grew slowly but surely and when we were precipitated into the World War, some of the nurses resigned to take military service; others were called to do public health nursing in the Sanitary Zones. To include this group the service was extended to a Bureau of Public Health Nursing.

Facts revealed by the drafts emphasized the almost universal need of increased health measures, so it was decided that a first step to meeting this need might be a country-wide extension of its Public Health Nursing Plan. In short, the Red Cross, with no desire to monopolize or even establish such a service where public or private agencies were already at work, decided to throw its great war machinery for the alleviation-of-suffering-from-war into a movement for the alleviation-of-suffering-of-peace of this generation and the prevention-of-suffering for future generations. The heartaches of 300,000 mothers annually with empty arms because of the loss of babes from preventable disease, the hollow cheeks and eyes of thousands of sufferers annually from tuberculosis (the most preventable of all chronic diseases), the hundreds of thousands with physical defects demanding correction were ample challenges to engage battle.

The Chapter Organization of the Red Cross made a more universal under-

standing and acceptance of the importance and procedure of Public Health Nursing possible. Its coöperation with all agencies during the war made it easy of approach in securing its coöperation for this undertaking in localities where agencies were already engaged in Public Health Nursing or a channel for administration where none existed.

Local and State Boards of Health receiving a fixed sum with which to meet health problems have ever found difficulty in securing increased appropriations to meet emergencies. Appropriations require time and concerted action. Oftentimes they must be accompanied or preceded by legislation which requires more time. Local health authorities cannot always reach the homes of the community except in times of universal disasters, such as epidemics or disasters affecting all the people. The Red Cross Chapter—made up of the community homes—might become the channel of opportunity for advancing public health measures. Recognizing this, National Headquarters urged chapters to organize strong nursing committees composed of people in the community already interested in its health. Without community backing Public Health Nursing will reach only a limited number and fails in its service. Without qualified nurses to carry on the technical nursing involved and the principles of sanitation and hygiene to be taught and practiced, it must fail. This fact was equally recognized and a standard set for personnel employed. This standard is enrollment as a Red Cross nurse, which means graduation from a type of training school recommended by a committee of nurses, State registration and additional experience under supervision, or training in a course of at

least four months in Public Health Nursing. In establishing such a standard, the Red Cross was mindful of its obligations to the American Nurses Association, the National Organization for Public Health Nursing and the League of Nursing Education, which have labored for better education and preparation of all nurses for the care of the sick. From the ranks of these organizations has the Red Cross Service been formed. Their support for any undertaking in Public Health Nursing is self-evident.

The North Carolina State Board of Health was quick to recognize the impetus and service that could be rendered in an extension of its program.

Dr. Livingston Farrand, chairman of the Central Committee of the American Red Cross, submitted to all State health officers a set of principles and plan of coöperation for the development of Public Health Nursing. This, with slight amendments, was accepted by the State Board of Health of North Carolina, and contains provisions for carrying it out through the establishment of a Bureau of Public Health Nursing in conjunction with its Bureau of Infant Hygiene.

The bureau is made responsible for carrying on a State-wide educational plan of work directed to the improvement of maternal and infant hygiene; for assisting in the adequate development and establishment of Public Health Nursing service in the counties of North Carolina. The State supervising nurse is nominated and employed by the State health officer and approved by the American Red Cross. The other personnel of the bureau is appointed by the supervising nurse and approved by the State Board of Health and the Red Cross. Funds not to exceed \$12,000 annually are shared equally by the State Board of Health and the American Red Cross for this year. (The State Board in addition furnishing office, light, water and fuel.)

The arrangements for work in the

counties provides for appointment of county nurses to be approved by the State health officer and Red Cross and the organization of a county council or committee to advise with and assist the nurses. The funds of the county and of the local Red Cross chapter contribute to support the county service.

The chief value of the nurses' services is recognized as educational work in the field, and a plan of work is presented for counties either with or without a full-time health department. Where such exists the work of the nurse shall be under direction of the health officer. The work to be carried on by units of public health work as follows:

The Infant Hygiene Unit shall consist of organization and instruction of mothers' clubs and other groups in the essentials of home sanitation, prenatal and postnatal care, feeding of infants through a course of lectures furnished by the State Board of Health, physical examinations made and recorded of children brought. (This designed to foster more intelligent care and oversight of children by parents.) A tack map shall indicate breast and bottle-fed babies and children under two years suffering from diarrheal disease. Visiting homes of artificially-fed or diseased children; conferences with expected mothers, including urinary test and pelvimetric measurements; the adoption of regulations for control of midwives and individual or group instruction.

The Tuberculosis Unit shall consist of securing names of persons in the county with tuberculosis. The posting of cases and deaths on a tack map. The visiting in homes (from where deaths from tuberculosis or active cases have been reported) as often as necessary to give care and instruction helpful in utilizing best means of treatment and prevention, especially soldiers, sailors or nurses, who have been in service, etc. The use of lectures, lantern-slides, literature and publicity approved by the Bureau of

Tuberculosis in an educational campaign. Arranging clinics for examination of suspects in accordance with plan of State Tuberculosis Sanatorium.

The Quarantine Unit shall consist of assisting the county health director in performing his duties relating to control of communicable disease.

The Quarantine Unit shall consist of Unit calls for assisting health director in recording and classifying defective children and securing through education as many corrections as possible.

The Soil Pollution Unit shall consist of assisting the county health officer in finding and treating children afflicted with hookworm and through education seek to bring about the widespread adoption and use of sanitary privies. (Where county health departments have not been established the nurses shall carry out the units of work under the direction of the State supervising nurse and county council of the chapter.)

Records and reports are kept in accordance with the requirements of the State Board of Health and American Red Cross. In addition to funds from National Headquarters, chapter funds are paying salaries and transportation for sixteen nurses carrying

out the county plan of work. During the last half of the year 1919 eight of these nurses (working for periods of from three to six months) made 6,130 home visits of which 1,437 were in the interest of infant and maternal welfare, 629 in the fight against tuberculosis, 608 in interest of school children. In 2,347 cases some actual nursing care was given. Talks to groups, clubs and schools, sanitary inspection visits, school examinations and many other services rendered show the broad field of usefulness the nurse covers. Supplementing this work in North Carolina, Red Cross chapters during the last half of 1919 held 107 courses in "Home Hygiene and Care of the Sick," and certificated 1,630 pupils. The measure of gain in health knowledge has been admirably demonstrated in the wonderful work done by the women of North Carolina in the recent influenza epidemic.

The Red Cross chapters of North Carolina and the Division Staff Department of Nursing, appreciate the wonderful work that the State and County Boards of Health are doing and are glad to have a share in their activities and aid in their extension.

## "THE PUBLIC HEALTH NURSE"

*The Public Health Nurse*, the only magazine in America devoted exclusively to the field of Public Health Nursing, is practically indispensable to the public health nurse who desires to keep in touch with the latest developments in her profession.

In this magazine new books are reviewed, lists of pamphlets given, bibliographies listed, and attention called to special articles in current magazines that are of interest to nurses in the field. Subscription to the *Public Health Nurse* is included in the membership fee of the national organization of \$2 a year. This magazine is published by the N. O. P. H. N., 2157 Euclid Ave., N. E., Cleveland, O.



## CONSTIPATION IN BABIES

BY ALBERT S. ROOT, M.D.

The best treatment for constipation is to prevent its occurrence. This is best done by getting the baby early in life into the habit of having a bowel movement regularly every day—at the same hour. Begin this training when the baby is four weeks old, as follows: Place the child on lap upon its back, hold the feet upward and insert into the rectum a small cone of oiled paper or a soap stick (made of *pure white soap*, about an inch long, and the size of a slate pencil). Still holding the feet upward with the left hand, place a small chamber gently against the buttocks with the right hand, letting the child remain upon its back until the stool appears. Repeat this every day at the same time—preferably at the time of his bath, about 10 o'clock—for three or four days, then omit the soap stick, using the chamber as before. After waiting for five or ten minutes and no stool appears, use the soap stick. By perseverance and patience the baby will soon acquire the regular habit of having a daily bowel movement and soiled diapers will be largely done away with.

### Breast-Fed Babies

Few breast-fed babies are constipated, but when they are so, then train them as outlined above and give one-half to one teaspoonful of milk of magnesia at bedtime. This will be taken better by the child if it is mixed with a small quantity of breast milk.

Never use castor oil for constipation, as it makes the baby more constipated. It is harmful to use enemas frequently, as they make the muscles of the rectum weak when they are used daily over a long period of time.

### Bottle-Fed Babies

Bottle-fed babies are as a rule more constipated than those breast-fed. The

food the baby is taking may be too low in fat or sugar, although an excess of fat may cause constipation. The milk formula may be too weak. In case of constipation—in these babies—it would be well to use maltose sugar in the milk in preference to other sugars. Tomato juice or orange juice, strained, and given a half hour before the first bottle in the morning will be helpful. The tomato juice is prepared as follows: Place a ripe tomato in hot water until it softens. Then strain the clear juice through a very fine sieve. Canned tomatoes may be given equally as well. Place the can in warm water, then strain. One or two ounces (from two to four tablespoonfuls) should be given, depending upon the age of the child. Try to have the baby drink as much cool boiled water between feedings as possible.

A teaspoonful of milk of magnesia placed in the night bottle will often be sufficient to produce the desired effect, but if the bowels have not moved by midday an oiled cone of paper or a soap stick should be used.

### In Older Children

After fifteen to eighteen months of age, constipated children should be given cooked fruit daily—apples, plums, peaches, pears or prunes—but not berries. Their diets should contain fresh vegetables each day. After three years of age they may have raw fruits (not bananas) and should not drink over a pint of sweet milk a day, but water freely between meals. Two or three teaspoonfuls of honey may be given at breakfast or supper. Molasses at breakfast or supper will have a laxative effect. Coarse food, as Graham crackers, bran cakes, will help. The flour used in making bread or biscuit should be whole wheat flour or unbolted flour. The most useful

drug in case of older children is tasteless mineral oil. It has no medicinal effect, but lubricates the intestinal tract and makes the stools softer. Two teaspoonfuls to an ounce given at bedtime each night will often correct entirely the condition. It should be given regularly and the amount decreased as the condition improves. Sometimes more active drugs are required and of these Cascara Sagrada is one of the best. It can be given either as the elixir (one-half to one teaspoonful) or the fluid extract (one to five drops). It is important that older children

should be made to go to the toilet when they have an inclination to have a bowel movement. Children engrossed in their play are very apt to neglect to do this.

In addition to these measures, the child should take plenty of out-door exercise. Special exercises to develop the abdominal muscles are helpful—for instance, standing upright with arms extended above the head, then bend forward, touching the floor with the fingers, then up again—and this repeated until the child is tired.

## DIARRHEAL DISEASES OF INFANCY

BY ALBERT S. ROOT, M.D.

Two thousand six hundred and twenty-six babies under two years of age died in North Carolina last year of diarrheal diseases. Think of this waste of human life, of the actual economic loss, of the intense suffering of these little ones and the sorrow brought to the grief-stricken parents!

Can we not, by understanding more about the causes of these diseases, by the proper feeding of our infants and by instituting the proper treatment early, reduce this frightful mortality? It is necessary, first, to have a clear knowledge of the causes and so prevent their occurrence if such be possible.

First of all, an infant's intestinal tract is most sensitive to

- (1) Improper food
- (2) Infection by germs

Bear in mind that breast milk is the most easily digested food and is free from the germs which cause these diseases and hence every baby should, if possible, be nursed or partially nursed for the first year of life. Mother's milk then, is the first great preventive.

Proper bottle-feeding of well babies during the first year, when necessary,

and proper feeding during the second year is the next important consideration and preventive. Schedules of feeding of infants at various ages and the method of preparing the food will be furnished by request to any one in the State by the Bureau of Public Health Nursing and Infant Hygiene, State Board of Health, Raleigh, N. C.

It is important to know that the most serious of all the diarrheal diseases is caused by germs which are swallowed by the baby. These more often come from impure milk than from any other source, and also from impure drinking water, and sometimes from food contaminated by flies.

Milk is easily made unfit for infant feeding. There are certain things you must do to keep milk pure during the process of milking. These are:

- (1) Keep the stable clean.
- (2) Keep the cow clean.
- (3) Wash the cow's udders with soap and water.
- (4) Scrub your hands with soap and water.
- (5) Milk into a vessel which has been washed and scalded, and scald all other vessels into which the milk is poured.

(6) Cool the milk immediately after milking and keep it cool.

After protecting the milk so far, you must further care for it according to these directions:

(1) Boil the baby's milk mixtures, except in cold weather, for three or four minutes. Cool it quickly by placing the vessel of hot milk into a larger one of cold water. Pour into the nursing bottles, stop with sterile cotton and keep cold.

(2) Boil the nursing bottles just before making up the milk mixtures.

(3) Wash the nipples after each feeding with soap and water and keep in boric acid solution (one teaspoonful of boric acid crystals to a glass of water).

(4) Never use milk for the baby which is over 24 hours old.

(5) Always wash the bottles immediately after the baby has finished its feeding.

(6) Never warm a bottle over again which has been refused at a previous feeding.

### Three Kinds of Diarrheal Diseases

Without going into details, let's understand a little more about the different kinds of diarrheal diseases. They occur much more frequently in summer for several reasons: (a) because it is harder for an infant to digest food in hot weather; (b) because germs multiply in the milk so much more rapidly and (c) because of the presence of flies.

There are three kinds of diarrheal diseases:

- (1) Simple indigestion.
- (2) Indigestion with fermentation.
- (3) Infectious diarrhea, often called colitis.

*Simple Indigestion* is caused by either too much food, or a milk mixture which does not suit the baby.

*Symptoms.* Loose stools, usually three or four daily, containing mucus and undigested food. There may or may not be slight fever.

*Indigestion with Fermentation* is caused by the action of germs in the intestines chiefly upon the sugar—also upon the fat in the milk. This is the type which is so often seen when babies are fed upon prepared "baby foods," which contain a large amount of sugar.

*Symptoms.* Loose, green, mucus stools—three to six daily—which are acid as a result of which the baby's buttocks are "scalded." They are sometimes frothy in character. There is always some fever and often it is very high. The baby is distinctly sicker than in case of simple indigestion.

*Infectious Diarrhea (Colitis)* is caused by germs introduced from outside the body, having been swallowed by the child. These attack the lower part of the bowels, causing ulcers.

*Symptoms.* It may begin suddenly or follow indigestion with fermentation. The stools are frequent—the bowels often moving every half hour or hour. At first the stools contain mucus and undigested food, but later consist of mucus and blood. They have an odor resembling wet hay. Straining accompanies each stool—often very intense. There is abdominal pain and great prostration. The child has fever, heavily coated tongue and loses its appetite. In the case of those babies who survive, the symptoms gradually subside, but it is always a matter of weeks, and more often months, before they entirely recover.

*Treatment.* At the beginning of any of these three types of diarrhea, the treatment is the same:

- (1) Cleanse the intestinal tract.
- (2) Give the intestines a rest by stopping all food.

*Cleansing the Intestinal Tract.* This should be done at once, preferably by castor oil:



1 teaspoonful under 6 months of age.

2 teaspoonfuls for a child 1 year old.

3 teaspoonfuls for a child between 1 and 2 years of age.

If castor oil is vomited, give broken doses of calomel—one-sixth of a grain every half hour for six doses for a child one year old and followed two hours after the last powder with two teaspoonfuls of milk of magnesia.

Do not repeat the purgative. Much harm is done by giving castor oil day after day, as is so frequently done in these cases. Give, therefore, a sufficiently large dose of purgative to empty the intestines thoroughly and then stop.

*Intestinal Rest.* Give nothing but barley water or plain boiled water for 12 to 24 hours. (The mother who is nursing her baby can use a breast pump during this time.) At the end of 12 to 24 hours, a baby who is nursing its mother should be put to the breast every four hours and nursed for five minutes only. Boiled water must be given between nursings.

The five-minute nursings should be gradually increased to twenty minutes, the four-hour interval remaining the same.

In bottle-fed babies this plan of treatment is recommended: After the starvation period, clean, freshly-made buttermilk is the best food. If this cannot be had, use dry milk. The buttermilk should be kept in a cold place and slightly warmed before giving.

*For An Infant Three Months of Age.* One and one-half ounces of buttermilk and two and one-half ounces of boiled water should be given every four hours the first day, and a day or two later two ounces each of buttermilk and boiled water every three hours.

*For An Infant Six Months Old.* Three ounces each of buttermilk and water should first be given every four hours, and after a few days two parts

of buttermilk and one of water every four hours.

*For An Infant Eight Months Old.* At first equal parts of buttermilk and water, then two parts of buttermilk and one of water, and shortly three parts of buttermilk and one of water.

Boiled and cooled water must be given between feedings.

The buttermilk should be strained, so that it will not be lumpy, and the hole in the nipple enlarged.

Some babies at first do not like the taste of buttermilk. You may add one-half grain of saccharine dissolved in a little water to each six or eight-ounce bottle or glass to sweeten it, but don't use sugar for this purpose. Keep trying and he will like it after a few days.

Dry milk is cows' milk which has been dried and powdered and to which nothing has been added. When mixed with the proper amount of water it makes a well balanced food, thereby differing from most of the prepared "baby foods." The Bureau of Public Health Nursing and Infant Hygiene will be glad to give information regarding quantity to be used in a given case. It must know the naked weight of the baby.

When the stools become pasty and are free of blood and not over three or four in twenty-four hours, skimmed milk mixtures or dry milk can be given. If skimmed milk is used it should be boiled with the water and no sugar added at first. The dilutions should be equal parts of skimmed milk and water for a child three months old, two parts of skimmed milk and one of water for a child six months old, three parts of skimmed milk and one of water for a child nine months of age.

After a period of a week—if the baby is improving—the milk should be only partially skimmed. At first about one-third, some days later one-half, later two-thirds, etc., of the cream being allowed to remain upon the milk used.

If the baby's milk formula has contained sugar, this is added last by degrees.

The medical treatment of these cases should be under the close direction of a physician. Where the services of a physician are not available the following suggestions are offered:

In infectious diarrhea, where the bowels are moving as often as every hour or two, give paregoric in a little water every two hours—five to ten drops for a child six months old and fifteen to twenty drops for a child eighteen months old. Be sure the intestines are empty before giving it. It should be stopped when the movements are less frequent or when the child becomes stupid.

It would be wise to give about one-fifth of a level teaspoonful of soda in a tablespoonful of water every three hours.

Flushing the bowels with a quart of warm salt water (two level teaspoonfuls of salt to a quart of water) once or twice daily will help control the straining and frequency of bowel movements. This is done by means of a fountain syringe, to which is con-

nected a soft rubber catheter (No. 20, French). The bag is held about two feet above the buttocks of the child, who is placed upon his side or back, and the end of the greased tube inserted before the salt solution is turned on. As the solution fills the bowels the tube is gradually pushed higher up. The salt water will come back by the side of the tube. The salt solution should be given until it comes back clear.

Disturb the patient as little as possible. Give him all the boiled water he can drink. This is most important as he is losing so much fluid from his purging.

Bear in mind that the feeding of these diarrheal cases is the all important part of the treatment and that the fewer drugs the child has the better. There is always danger of further upsetting the stomach and intestines by their use. As a matter of fact, most of these cases, unless they be infectious diarrhea, require no drugs whatever except the initial purgative, but the greatest care in the kind of food and its preparation.

## THE TIME TO TEACH

By ROSE M. EHRENFELD, R.N.

As the entire subject of child welfare is tied up in the "welfare of the mother" an opportunity for "teaching mothers" should never be lost. No greater opportunity exists in North Carolina than through "*Little Mothers' Leagues*" for girls over twelve years of age. The majority of girls this age really take the part of "little mothers" for younger brother, sister or baby of the family and the subject of infant care strongly appeals to them. Proper instruction at this time makes the children intelligently useful in their homes and instills in their minds a nice attitude towards motherhood.

"*Little Mothers' Leagues*" are organ-

ized clubs with officers selected by the girls from among their group. They hold regular meetings at which a graduate nurse is the guest and speaker and at each of the twelve meetings presents some phase of infant care, giving a demonstration. Each meeting is opened with a roll call and a quiz conducted by the little president on the subject covered in the preceding lesson, following with a "demonstration" by one of the girls in the class, following which the nurse takes up the new subject. Thousands of girls in New York City schools are enrolled during the last six weeks of



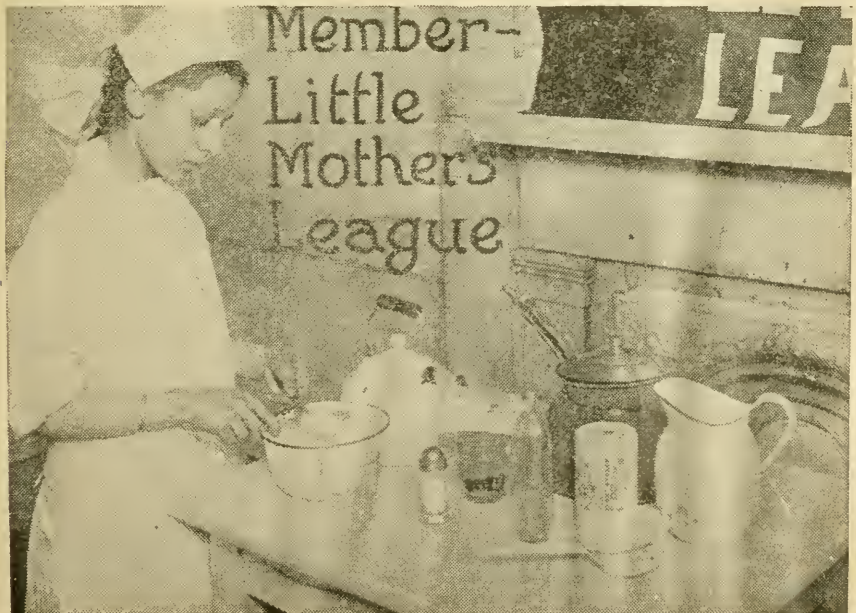
### A BUSY LITTLE MOTHER

school and render valuable service in their homes.

Such leagues are strongly recommended as a practical way of enlisting the coöperation of girls in the campaign to reduce infant mortality and a general outline of the opening lecture and subsequent lessons *will be fur-*

*nished* any registered nurse in the State, desiring to "enroll and instruct" a group of Little Mothers—who will act as voluntary aides of the Bureau of Public Health Nursing and Infant Hygiene in its efforts to reduce infant mortality in North Carolina.

In industrial centers especially do



TEACH THE GIRLS USEFUL THINGS



we believe such instruction would react to the interest of the employers, as many of the mothers are employed in industry—and not infrequently, where large numbers of them are employed, is irregularity of output the result of their absence because of illness in the homes due to improper feeding of babies and lack of proper attention.

Our schools succeed fairly well in preparing the boy for business and the girl for society, but neither is prepared for life, which is after all the chief thing. Can we afford to neglect offering an opportunity to prepare for what is most girls' chosen profession—home-making and motherhood? Only in this way, in time, shall we cease to encounter in our homes the colossal ignorance in regard to personal hygiene

and home sanitation which too many women view with complacency.

I sincerely hope the day is not far distant when our girls will not have to depend on an occasional public health nurse with social vision to give to them a course in "Home Care of the Sick" or the "Care of Babies," but that such instruction will be included in the school curriculum and made compulsory for every girl who gets a certificate from our public schools. I believe this is a thing that is coming with the *progress of events* and the most important part of a girl's education as the primary need of an infant is a competent mother.

It is mighty good as it is, but the State with the largest birth rate ought to be a *better baby State*.

## WHAT IS A PUBLIC HEALTH NURSE?

BY ROSE M. EHRENFELD, R.N.

She is a "graduate nurse doing any form of social work in which the health of the public is concerned, and in which her training as a nurse is used and recognized as a valuable part of her equipment." She is a potent instrument for achieving one of the ideals of democracy and stands for equality of opportunity in life's first essential—physical health—and represents the interests, purpose and ideals of one of the most vital of the newer professions—a profession which numbers approximately eight thousand practicing public health nurses in 1919, and which, according to Assistant Surgeon General C. C. Pierce, of the United States Public Health Service, should number fifty thousand, to meet the requirements of existing Federal and State legislation.

She may be an infant welfare nurse, a school nurse, a medical social service, a tuberculosis, or a communicable disease nurse, an industrial nurse, a district or visiting nurse. If she is work-

ing alone in a small community or in a rural district she may combine these functions.

She must be a graduate of an accredited hospital training school and a registered nurse if living in a State where there is a law providing for registration of nurses.

She should have taken a post graduate course in public health nursing at one of the universities or other institutions offering combined theoretical instruction with field work under supervision and direction of public nursing associations. She must be a leader and organizer and know how to awaken public interest and secure support for public health work and know not only how to nurse and care for the sick, but also how to teach people to keep well, for which a knowledge of "how to teach" is essential.

The usual hospital course of two or three years does not fit her to meet the family and community problems which constitute a large part of her

daily responsibility, nor does it supply the requisite knowledge of how to do practical work without the apparatus to which she has been accustomed. In addition to her hospital training, a nurse must have some knowledge of health administration and of social service. A post-graduate course will add a great deal to her probably meager knowledge of communicable diseases and the practice of preventive medicine, with its problems of sanitation, etc.

No other type of work is more dependent for its success and growth upon the personality of the individual worker than public health nursing. The nurse has a wonderful opportunity to teach, as the very nature of her work establishes a feeling of friendliness and receptibility on the part of families and communities she is serving.

In view of the enormously increased demand for public health nurses which has resulted from the experience of the war and the influenza epidemic, special emphasis is given by the N. O. P. H. N. and post-graduate centers to increasing present facilities for training nurses in public health work and developing and maintaining educational standards. Equally important is the bringing of high-grade recruits into these training courses and in interpreting public health nursing to the communities which they serve.

*Scholarships.* Graduates from accredited hospital training schools—especially those who have high school diplomas or college credits—who are interested in public health nursing as a field for work and desire information concerning special courses or scholarship funds in order to qualify for public health work are invited to write either to the Southern Division, American Red Cross (Miss Jane Van De Vrede, director of nursing, 249 Ivy Building, Atlanta) or to the Bureau of Public Health Nursing and Infant Hygiene, State Board of Health, Raleigh, N. C. No nurse who demon-

strates her adaptability for public health work should hesitate about taking a course simply because she has not the full amount of money needed. The North Carolina State Red Cross Seal Commission has set aside \$1,000 in scholarship funds for use of North Carolina nurses and scholarships have also been furnished by the Southern Division American Red Cross and Metropolitan Life Insurance Company.

*Courses in Public Health Nursing* are given at the following places:

*Massachusetts*—Eight months' course at School for Public Health Nursing, 561 Massachusetts Avenue, Boston. Conducted by Simmons College and the Instructive District Nursing Association, Boston. Tuition, \$89. Requirements, high school graduation and eligible for N. O. P. H. N.

Four months' course same. Tuition, \$20. Eligible for N. O. P. H. N.

*Connecticut*—Eight months' course at New Haven Visiting Nurse Association in coöperation with Yale University, New Haven. Tuition, \$50. Requirements, graduate registered nurse, eligible for N. O. P. H. N.

*New York*—Four months' course at Buffalo Visiting Nurse Association in coöperation with University of Buffalo. Tuition, \$25. Requirements, graduate registered nurse.

One, two and three-year courses Teachers' College, New York City. Tuition, about \$214 a year. Requirements, high school graduation, diploma from approved school of nursing, registration.

Eight months' course, theory and practice, Teachers' College, in coöperation with Henry Street Settlement. Tuition, about \$148. Requirements, same. Fifteen working scholarships awarded at close of first term.

Four months' course, theory, Teachers' College, and practical training with Henry Street Settlement. Tuition, about \$45. Requirements, same.

*Pennsylvania*—Nine months' course at Pennsylvania School for Social Service, 1302 Pine Street, Philadelphia.

Tuition, \$100. Requirements, high school graduate, eligible N. O. P. H. N.

Four months' course, same. Tuition, \$35. Requirements, graduate registered nurse, eligible to N. O. P. H. N.

*Ohio*—Eight months' course, School of Nursing and Health, College of Medicine, University of Cincinnati. Tuition, \$50. Requirements, graduate registered nurse, eligible to N. O. P. H. N.

Eight months' course, School of Applied Social Sciences, Western Reserve University, 2739 Orange Avenue, Cleveland. Tuition, \$150. Requirements, high school or equivalent, eligible N. O. P. H. N.

*Illinois*—Four months' course, Chicago School of Civics, 2559 South Michigan Avenue. Tuition, \$40. Requirements, graduate nurses, education equivalent to high school.

*Missouri*—Nine months' course, School of Social Economy, 2221 Locust Street, St. Louis. Tuition, \$50. Requirements, graduate registered nurse.

Four and one-half months' course, same. Tuition, \$25. Requirements, same.

*Michigan*—Eight months' course, University of Michigan, Ann Arbor, in coöperation with public health nursing agencies in Detroit and rural Michigan. Tuition for residents of Michigan, \$26.40; for non-residents, \$38.40. Requirements, high school graduates, graduate registered nurses.

Four months' course, same. Tuition, \$26.40. Requirements, graduate registered nurse.

*Minnesota*—Four months' course, University of Minnesota, Minneapolis. Tuition, \$25. Requirements, graduate registered nurse.

*Virginia*—Eight months' course, School for Social Work and Public Health, Dr. H. H. Hibbs, 1228 East Broad Street, Richmond. Tuition, \$65. Requirements, graduate registered nurse.

Four months' course, same. Tuition, \$35. Requirements, graduate registered nurse.

## BABY WEEK

The Children's Bureau has set no date for a National Baby Week campaign this year, but it heartily endorses such campaigns for local communities, which may be announced for any date convenient to the locality.

A "Suggested Program for Baby Week in North Carolina" will be furnished by the Bureau of Public Health Nursing and Infant Hygiene upon receipt of request.

Good stock comes from inheritance, not by manufacture, as truly in men as in timber. Men do not gather grapes from thorns nor figs from thistles, neither do strong constitutions, as a rule, spring from weak ancestors.



## THE CARE OF THE MOTHER

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The life, health and normal development of the child depend largely on the health and protection of the mother.

The chances of an infant's living depend on:

1. Sufficient income for family needs.
2. Health and right living of parents.
3. Protection of the expectant mother from overwork, underfeeding and worry.
4. Skilled supervision of pregnancy and confinement.
5. Rest and adequate care during the lying-in period.
6. Maintenance of breast feeding.
7. Intelligent mother care in the home.

*A mother can injure the child she carries just as much during the nine months before birth as during the nine months after birth.*

### Infant Mortality

*More than half of the babies who die during the first year of life die from causes related to the condition of the mother.* In 1916 in the returns from 70 per cent of the population of the United States there were over 75,000 deaths of children under 1 month of age (45.9 per cent of total infant deaths). Most of these are the babies who are born too weak, too injured, or too diseased to live. Some of these little ones died *also because their mothers did not know how to safeguard their breast milk nor appreciate the importance of breast feeding.*

These babies were an unnecessary sacrifice to ignorance and bad living conditions.

*The protection of maternity can no longer be evaded.* This wastage of life at birth must stop, for not only is every infant a potential citizen but the same conditions which account for half of our infant deaths are *impairing the health and vitality of those who survive.* It is not those who die *but those who live* that should now be considered.

### Maternal Mortality

Few of us realize that child-bearing is at present one of the most dangerous occupations as far as life is concerned. In 1916 we lost in the United States at least sixteen thousand women from all causes connected with child bearing, and practically all of these deaths were preventable. Child-bed fever is the most frequent cause of death among child-bearing women, and is a form of womb infection, largely due to the introducing of infection on the hands of the attendant at the time of childbirth.

One mother dies among every 150 cases of childbirth; one child in every 20 born does not live six weeks. The death rate in the trenches was about one in 50 of the men actively engaged.

*Why waste life needlessly?*

### Before the Baby Comes

See that the mother has:

1. Early consultation with a well-trained physician; complete physical examination, including pelvic measurements, and frequent examinations of the urine.
2. Ample nourishing diet, with plenty of milk.
3. Abundance of liquids, especially water.
4. Regulation of constipation, by food if possible.

5. Daily bath to increase elimination by the skin.
6. Attention to teeth and necessary dentistry.
7. Sufficient rest and sleep.
8. Work and exercise moderated to prevent fatigue.
9. Proper clothing and the possibility of recreation.
10. Outdoor airing daily, or at least free ventilation of the bedroom.

### Trained Attendance During Confinement

The skilled assistance necessary to make confinement safe demands a special training, and is indeed a special branch of surgery. The best surgeon is none too good if one is suffering from appendicitis or a broken leg. A trained veterinarian is always called in for valuable farm stock. *Do not the life and future health of a wife and child warrant the best medical and nursing skill available?*

### After the Baby Comes

A woman should rest in bed at least one week, and should not resume full household duties for at least one month after confinement.

She needs this period of rest:

1. To heal and recuperate.
2. To obviate hemorrhage.
3. To produce milk for her baby.

Hard work inside or outside of the house is taking the flesh off the baby. The energy of the mother's food is used up in hard manual labor instead of going into breast milk for the baby.

*Pregnancy is not a disease—it is only health under a strain. Learn how to ease the strain.*

When every expectant mother is properly cared for at home, and when every expectant mother has skilled supervision and attention during pregnancy, confinement, and the lying-in period

### MATERNITY WILL BE SAFE FOR WOMEN

## WHAT DO GROWING CHILDREN NEED?

In answer to this "problem for parents," the U. S. Department of Labor, through the Children's Bureau, tells us that every child has the right to be well born, well nourished, and well cared for, and that child-welfare experts consider the following necessary for the child's best growth and development:

### Shelter

- Decent, clean, well-kept house.
- Plenty of fresh air in the house, winter and summer.
- Warm rooms in cold weather.
- Separate bed, with sufficient bedclothes to keep warm.
- Sanitary indoor water-closet or outdoor privy.
- Pure, abundant water supply.
- A comfortable place to welcome friends.
- Has your child these?*

### Food

- Three square meals a day.
- Clean, simple, appetizing, well-cooked food.
- Meals at regular hours and sufficient time for them.

Dinner at noon for children under 7 years of age.

The daily diet should include:

Milk, at least 1 pint a day.

Cereal and bread.

Green vegetables, especially leafy vegetables.

Fruit.

Egg, meat or fish. If no one of these three is used, an additional pint of milk should be given.

*Has your child these?*

#### Clothing

Clean, whole garments.

Different clothing for day and night, suited to the climate.

Change of underclothes and nightgown at least weekly.

A change of stockings at least twice a week.

Warm underclothing and stockings in cold climates.

Heavy coat, cap, and mittens for cold weather.

Shoes, free from holes, and long and wide enough.

Foot protection against rain or snow.

*Has your child these?*

#### Health and Personal Habits

Hands and face washed before meals and at bedtime.

Bath every day, or at least once a week.

Natural bowel movement every day.

Teeth brushed at least twice a day (morning and night).

Regular bed hour.

Ten hours of sleep at night, with open windows.

Correct weight for height.

*Has your child these?*

#### Recreation and Companionship

A safe, clean, roomy place for outdoor and indoor play.

At least two hours outdoor play every day.

Constructive and suitable playthings and tools.

Some one with sympathetic oversight to direct the play.

The right sort of playmates.

*Has Your Child These?*

#### Education and Work

Schooling for at least nine months a year from 7 to 16 years of age.

Not more than two hours of "chores" outside school hours.

Not enough work either in school or out to cause fatigue.

Vacation work, if any, must allow ample opportunity for the proper amount of rest and recreation.

*Has Your Child These?*

#### Religion and Moral Training

Opportunity for religious training.

Proper moral and spiritual influence in home.

Teaching of standards of right and wrong in daily life.

*Has Your Child These?*

*Is your child getting a square deal?*

*If not, what are you going to do about it?*

WISE PARENTS ARE A CHILD'S BEST ASSET



## HOW TO PREPARE ARTIFICIAL FOODS

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### HOW YOU FEED IS AS IMPORTANT AS WHAT YOU FEED

#### Equipment

1. Nursing bottles (6 or 8) holding at least eight ounces. Large-necked bottles and nipples are more easily cleaned.
2. Nipples (6 or 8). Enlarge holes with hot cambric needle. A good supply of nipples saves time and steps.
3. Rubber nipple covers or cotton (if small-mouthed bottles are used).
4. Bottle brush.
5. Bottle rack or container. May be home-made out of any small pail with wires fitted in to separate bottles.
6. Two-quart pitcher (for mixing).
7. Glass graduate, holding at least eight ounces, graduated in one-half ounces.
8. Measuring spoons (table, tea, and half-tea sizes).
9. Mixing spoons (table and tea sizes).
10. Double boiler, holding one quart.
11. Saucepan, to boil water or scald milk.
12. Flat-bottomed soup kettle, fitted with false bottom, for sterilizing utensils.

#### Preliminary Preparation

1. Bottles, nipples, mixing pitcher, measuring graduate, and spoons should be washed in hot suds, rinsed in clear hot water, and sterilized five minutes by steaming or by boiling in hot water before using.
2. Milk, if not certified or pasteurized, should be scalded. Wipe the mouth of the milk bottle carefully before pouring out.
3. Boiled water, cereal water or gruel should be prepared. Clean milk can be spoiled by dirty handling.

#### Mixing the Food

The hands should be carefully washed, the utensils removed from the sterilizer without touching the top or the inside, and placed on a clean towel. Measure the sugar in a measuring spoon and dissolve it in hot water. Measure the boiled water or cereal water in the glass graduate. Empty the sugar and water into the mixing pitcher. Measure the milk in the graduate. Add it to the water in the mixing pitcher. Stir it with the mixing spoon. Fill the bottles with the desired amount, *measuring it only in the glass graduate.*

#### Care of Filled Bottles

Cool the contents quickly by standing the bottles in iced or running water. Keep cold by placing the bottles on ice, in iceless refrigerator, or in running water. At feeding time warm the individual bottles by standing them in hot water till the milk is comfortably warm (test it by dropping some on the wrist). Rinse the used bottles and nipples, letting them stand full of water until washed and sterilized.

THE HEALTH OF YOUR BABY DEPENDS ON ATTENTION TO DETAILS

## DECLARATION OF RIGHTS



WE, THE BABIES OF NORTH CAROLINA, BELIEVING WE ARE BORN TO ENJOY LIFE, HEALTH, LIBERTY, AND THE PURSUIT OF HAPPINESS, DO HEREBY SET FORTH OUR RIGHTS AS FOLLOWS:

*We demand:*

Our right to be well born.

Official recognition of our citizenship.

Good health.

Protection from contagions. A baby does not want to have measles, whooping cough, or scarlet fever.

Clean-living and clean-thinking parents.

A diet suited to our age and development and regularity of feedings.

Cool, pure water to drink between feedings.

A daily bath in a tub of our own.

Twenty hours of sleep each day until we are a week old, then sixteen hours until we are twelve months old.

A cool, quiet place to sleep by day and by night (with windows open), and bed our own.

A daily ride in the fresh air when the weather permits.

Quiet for our nerves. We don't want to be rocked, jogged, taken visiting or to moving pictures.

We don't like to be dirty, and will have good habits if started right. *Don't spoil us!*

Protection from indiscriminate kissing. Tonsillitis, diphtheria, tuberculosis, and all forms of infection can be communicated with a kiss.

That our health shall not be endangered by paregoric, soothing syrup, patent medicine, coffee, coca-cola, pepsi-cola, pacifiers, colored candy, woolly toys which harbor germs, or toys from which we can suck poisonous paint.

Our own time in learning to walk. We want our bodies to grow straight and strong.

The privilege of "kicking and crying" sometimes. We *must* get *some* exercise.

*Mother-love and Intelligent Care.* Love without intelligence will not make us healthy. Intelligence without love will not make us happy. We want to be **HEALTHY, HAPPY, BETTER BABIES.**

In witness whereof, we do hereby affix the seal of the *Bureau of Public Health Nursing and Infant Hygiene* and the signature of our smiling faces.



## THE DIFFERENCE

One-half the babies who die could be saved if they were nursed by the mother.  
THE COST OF FEEDING

Bottle-Fed Babies		Breast-Fed Babies	
Bottles	Ice		
Milk	Barley Water		
Nipples	Brushes		
Lime Water	Medicine		
Sugar of Milk	Doctor		

Breast feeding, the baby's right—the mother's privilege—should be given with clock-like regularity from the day of birth, at intervals prescribed by the physician.

All babies require intelligent as well as loving care, and both mother and infant benefit by thought given to the mother's diet, regarding which the "Mothers' Round Table" says:

"The diet for a nursing mother must be nutritious, laxative, and appetizing. She may follow her own wishes as to the choice of her food. The old idea that acid fruits and vegetables give the baby colic is probably not true, since all acids are changed in the process of the mother's digestion. However, if they or any other food or drink disturbs the mother's digestion, this may have an unfavorable effect upon the milk. It is necessary, therefore, to watch the diet very carefully and eliminate all articles that actually show themselves to be unsuited to the mother. If, in addition, a woman eats slowly, chews her food thoroughly, and above all, refrains from worry, there will be no reason to suppose that the maternal milk will not agree with the baby. Constipation should be guarded against as carefully during the period of lactation as during pregnancy.

"If the milk is scanty, the need for a more generous diet is indicated. Plenty of fresh milk, eggs, fresh vegetables, ripe fruit, and other plain, simple food are required. If the appetite is capricious, it will be well to eat lightly five or six times a day. It is necessary to reiterate the importance of a *quiet state of mind* for all nursing mothers. There is no one thing which more *certainly and completely* interferes with the secretion of the milk than any *overwrought, nervous condition*, and although in the presence of grave causes for worry or sorrow it seems sometimes almost impossible to be self-controlled, the thought that the little life, perhaps, is dependent upon it will serve to give the mother the strength required. The mother should have pleasant exercise, out-of-door life, pleasure, cheerful society, and be surrounded as far as possible with the things that interest her. She should strive to have at least eight hours of sleep at night, and, if her rest is broken then, to make it up during the day, when the baby sleeps. Plenty of fresh air and sunshine are always desirable.

"There is usually a period after the nurse has gone and the mother is left to herself when the weariness resulting from her own somewhat feeble health, broken sleep, and the worry consequent upon taking care of the baby alone causes the milk to diminish in quantity. It is at this time that many a mother concludes that the baby is starving and is very apt to become discouraged and give up nursing as hopeless. If the mother will only strive to carry herself and the baby past this epoch she will in all likelihood be able to nurse her little one quite successfully. At least every possible means to this end should be tried before weaning is resorted to."



## BOTTLE FEEDING

### CONSULT YOUR DOCTOR BEFORE WEANING THE BABY

#### The Best Form of Artificial Food

As many children have to be weaned or partially weaned even in the early months of the first year, the mother must know what to feed and how to feed her baby.

#### Cow's Milk the Best Substitute for Mother's Milk At Our Disposal

Cow's milk to be safe for the baby:

- Must be clean and free from adulterants.
- Must be free of disease germs.
- Must be relatively fresh (under 36 hours).
- Must be kept cold after production.

If the cow whose milk you feed your baby is not kept on your own premises, get certified milk or the best grade of pasteurized bottled milk. Otherwise always scald milk before using it for the baby. Where fresh milk cannot be obtained, milk powder (dry milk) is the best form of canned milk for infant use.

#### Amount of Whole Cow's Milk to be Given to a Well Infant

The amount of milk to be given in 24 hours to an infant depends on his age, weight and digestive powers. Most infants under one year need one and one-half ounces of milk to every pound of their own weight. With very young infants, or when weaning, it is safer to begin at one ounce for every pound of weight. Two ounces of whole mixed milk is more food than most infants can stand, and more than they need if other foods are used in their diet.

#### The Feeding Interval

Three hours between feedings is the shortest interval safe for the average child. Artificially fed children do better on a four-hour interval. Infants should be waked to be fed during the daytime. Feeding between 10 p. m. and 6 a. m. is usually unnecessary and unwise, so on a three-hour schedule a baby should take not more than six bottles, and on a four-hour schedule not more than five bottles in 24 hours. On a four-hour interval a child must be given more at a feeding to get as much in 24 hours as on a shorter interval when he gets one more bottle.

Example: Well Infant Under Six months of age

Three-hour Interval. Time of Feeding

6—9—12—3—6 and 10 p. m.—Six feedings in 24 hours.

Four-hour Interval

6—10—2—6 and 10 p. m.—Five feedings in 24 hours.

#### Average Amount Taken at a Feeding

<i>Infant</i>	<i>Amount</i>
1-3 days old -----	1/2 ounce
1 week -----	1-2 ounces
1 month -----	2 1/2-3 1/2 ounces
3 months -----	4-5 ounces
6 months -----	6 ounces
8 months -----	8 ounces

## MODIFICATION OF MILK

Decide on the amount to be fed at a single feeding and the total number of feedings in 24 hours. Take the amount of whole cow's milk suited to the weight and digestive capacity of the infant, dilute the milk with sufficient boiled water or cereal water to bring it up to the desired amount for the total number of feedings. One-half to one ounce of sugar (for cane sugar, three to six level teaspoonfuls) should be dissolved in the boiled water or cereal water before adding it to the milk. Mix well and divide it into the desired number of feedings.

Cereal water may be used after the first months instead of boiled water for diluting the milk. During the early months, it should be made by using only one-half a level teaspoonful of flour (barley or wheat) to a pint of water. This may be gradually strengthened to two level tablespoonfuls at six months and three level tablespoonfuls at nine months.

Example: A well baby, six months of age, weighing 14 pounds, has a stomach capacity of six ounces; therefore, if six meals a day are given, the total amount to be given would be 36 ounces; if five meals a day are given, the infant could safely be given seven ounces at a feeding, making the total amount 35 ounces; allowing one and one-half ounces of milk to the pound weight gives a total of 21 ounces.

## Feeding Formula

Milk (whole) -----	21 ounces
Water -----	14 ounces
Sugar -----	1 ounce (dissolved)
<hr/>	
Total -----	35 ounces

REGULARITY IN FEEDING IS THE FIRST HABIT A CHILD MUST  
ACQUIRE

## THE NATIONAL ORGANIZATION FOR PUBLIC HEALTH NURSING

The National Organization for Public Health Nursing, of which Miss Ella Phillips Crandall is Executive Secretary, the organization which represents nationally the ideals, interests and purposes of the public health nursing profession, is further extending its sphere of usefulness, first, by the expansion of its library; second, by propaganda services.

Branch library centers have been established in nearly all the states. These centers are supplied with the latest reprints, pamphlets, etc., on all phases of public health nursing, which are loaned to nurses and other health workers without cost except for postal charges. The Library service is designed to help the nurses and others

interested in public health to keep in touch with the most recent developments in the field of public health nursing. The advantage of the State Library Center is evident, inasmuch as it provides a carefully chosen collection of public health literature within quick mailing distance.

The value and completeness of this "State Library Center" lending service will be increased as fast as the need of it is made apparent to the State Librarian, Dr. Louis R. Wilson, University of North Carolina, Chapel Hill, who has already extended most cordial coöperation and has undertaken to handle this material in North Carolina.

Through its propaganda service the



(May 12, 1920) and who wish to take advantage of the excellent opportunity which this celebration offers for recruiting more nurses; a poster, in seven colors, size  $14 \times 18\frac{3}{4}$  inches, of which the above illustration is a reproduction. This poster can be adapted to the use of any group by leaving out the imprint of the National Organization for Public Health Nursing and substituting a local imprint or any other printed matter that may be desired; a sticker stamp in two colors, also like illustration above, for use in correspondence; a folder, "The Public Health Nurse," of particular interest to candidates for nursing training, describing the different types of public health nursing and listing the training courses now available; a diet card, "A Suggestive Grocery Order for a Family of Five," prepared by the Boston Dietetic Bureau.

The National Organization for Public Health Nursing has also recently produced a two-reel public health nursing motion picture film entitled "An Equal Chance"—a lively dramatic narrative which features typical episodes of the influenza epidemic and includes accurate representations of the various branches of public health nursing work, that is, bedside care, home instruction, maternity care, infant welfare, school and tuberculosis nursing.

A price list and full information regarding this propaganda may be obtained by addressing the Publicity Secretary, National Organization for Public Health Nursing, 156 Fifth Avenue, New York City.

Literature on tuberculosis, flies, typhoid fever, malaria, hookworm, sanitation and sewage disposal, sex hygiene and other health subjects will be sent free upon request to the State Board of Health, Raleigh, N. C.



# DAILY HEALTH GUIDE

FOR

## BOYS AND GIRLS

### MORNING

*Brush teeth—Toilet*

### BREAKFAST

Fruit, cereals and plenty of milk,  
eggs, bread and butter

No coffee nor tea at any meals

*Eat slowly, walk to school. (Don't run.)*

### SCHOOL

GOING and COMING

Take ten deep breaths slowly,  
shoulders straight and head up.

*Don't sneeze near another person.*

*Use your handkerchief. Don't spit.*

### NOON

*Wash your hands and face; use soap.*

*Glass of water before eating*

### DINNER

Besides meat and potatoes, or  
rice, eat plenty of vegetables and  
only plain puddings or fruits.

Chew each mouthful thoroughly.

### AFTERNOON

*Walk slowly after eating. Keep cheerful.*

*Play out of doors after school.*

### EVENING

*Wash Face and Hands. Glass of water*

### SUPPER

Plenty of milk and fruits and fish or  
eggs instead of meat.

Fried foods are hard to digest.

### WINDOWS OPEN

*Top and bottom*

*SLEEP OUT OF DOORS WHEN YOU CAN.*



**UP SMILING**  
No loitering  
in dressing or  
chores



### RECESS

Play hard.

Put nothing dirty  
in your mouth.



**EARLY TO BED**  
12 hours sleep for  
young children,  
ten for all others



**A GOOD WASH**  
Before breakfast  
Brush your teeth



### FRESH AIR

Study hard.

Sit up straight  
at your desk.



**GLASS OF WATER**  
Brush Teeth.  
A hot bath  
twice a week

ISSUED BY THE NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS, 105 E. 22ND ST. NEW YORK.

Adapted by the National Tuberculosis Association from the "Daily Program" chart of the Wisconsin Anti-Tuberculosis Association.

Is there a "Daily Program" hanging in your school room?  
If not, why not?

## HEALTH RULES OF THE MODERN HEALTH CRUSADERS

1. Keep windows open or stay outdoors when you sleep, play, work or study. Breathe *fresh* air always and through your nose. Take ten *deep* breaths every day.

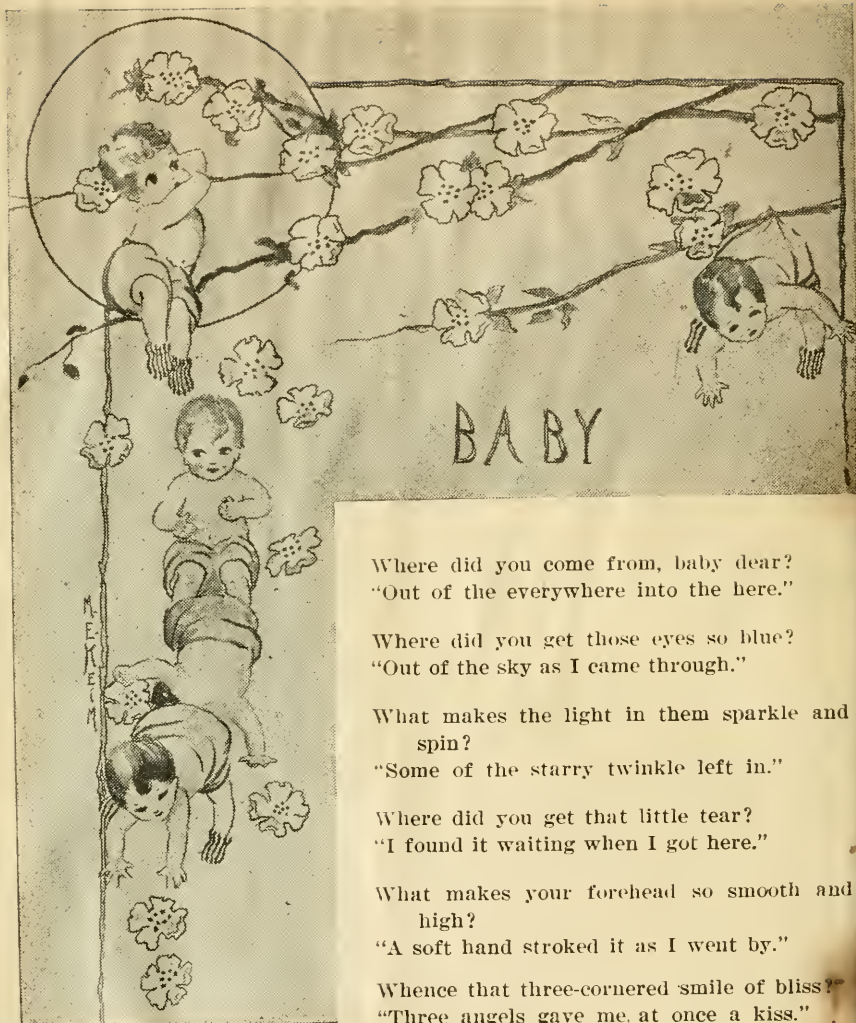
2. Eat wholesome food, including fruit and vegetables, and chew it thoroughly. Avoid greasy fried food, soggy breads, heavy pie and cake. Eat little candy; none that is impure. Drink plenty of pure water and use your own cup. Drink no tea nor coffee. Never take beer, wine or other alcoholic drinks or soft drinks containing injurious drugs. Do not smoke or use tobacco in any form.

3. Make sure that everything that you put into your mouth is clean. Wash your hands always before eating or handling food. Wash your ears and neck as well as your face and clean your finger-nails every day. Bathe your whole body twice a week at least and shampoo often. Brush your teeth thoroughly twice every day, after breakfast and supper. Have all cavities in your teeth filled. Consult a dentist twice a year.

4. Play and exercise every day in the open air. Sit and stand up straight. Have a *regular* time every day for attending to toilet and each need of your body. Whenever you cough or sneeze, turn your head aside and cover your mouth with your handkerchief. If you must spit, spit only where it will be removed before person or fly could touch it. Have a complete medical examination each year.

5. Get a long night's sleep. Get up smiling. Keep your clothes neat. Brush your shoes before going to school. Keep your mind clean and cheerful. Be helpful to others.

NOTE: Full particulars regarding the Modern Health Crusade will be furnished by Dr. L. B. McBrayer, Sanatorium, N. C.



## BABY

Where did you come from, baby dear?  
 "Out of the everywhere into the here."

Where did you get those eyes so blue?  
 "Out of the sky as I came through."

What makes the light in them sparkle and  
 spin?  
 "Some of the starry twinkle left in."

Where did you get that little tear?  
 "I found it waiting when I got here."

What makes your forehead so smooth and  
 high?  
 "A soft hand stroked it as I went by."

Whence that three-cornered smile of bliss?  
 "Three angels gave me, at once a kiss."

Where did you get this pearly ear?  
 "God spoke, and it came out to hear."

Where did you get those arms and hands?  
 "Love made itself into bonds and bands."

Feet, whence did you come, you darling  
 things?  
 "From the same box as the cherubs' wings."

How did they all just come to you?  
 "God spoke, and it came out to hear."

How did you come to us, you dear?  
 "God thought about you and so I am here."

GEORGE MACDONALD.





# The Health Bulletin

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*"And there came a grievous swarm  
of flies into the house of Pharaoh, and  
into his servants' houses, and into all  
the land of Egypt; the land was cor-  
rupted by reason of the swarm of flies."*

—Exodus 8:24.

SPECIAL ANTI-FLY NUMBER

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## FREE PUBLIC HEALTH LITERATURE

The State Board of Health has a limited quantity of literature on health subjects for free distribution. If you are interested in one or more of the following subjects, or want same sent to a friend, write to the State Board of Health for free literature on that particular subject.

WHOOPING-COUGH  
 HOOKWORM DISEASE  
 PUBLIC HEALTH LAWS  
 TUBERCULOSIS LAWS  
 TUBERCULOSIS  
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 INFANTILE PARALYSIS  
 CARE OF THE BABY  
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 MEASLES  
 GERMAN MEASLES  
 TYPHOID FEVER  
 DIPHTHERIA  
 PELLAGRA  
 CONSTIPATION  
 INDIGESTION

## GOOD BOOKS AND PAMPHLETS ON CHILD CARE

### MOTHERS

Why Not Make a Study of Your Profession?

#### *The Mother:*

The Prospective Mother  
 Prenatal Care

#### *The Baby:*

Infant Feeding  
 Care and Feeding of Children  
 Short Talks With Young Mothers  
 Care and Feeding of Infants and Children  
 How to Take Care of the Baby  
 Infant Care

#### *The Child:*

His Nature and Nurture  
 Dietary for Children  
 Food for Young Children  
 School Lunches  
 What to Feed the Children  
 Hygiene of the School Child  
 Child Care

#### *General:*

American Red Cross text-book  
 Home Hygiene and Care of the Sick  
 Milk, the Indispensable Food for Children  
 Feeding the Family

The Bureau of Public Health Nursing and Infant Hygiene will furnish names of publishers of above upon request.

# THE Health Bulletin



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Vol. XXXV

MAY, 1920

No 5

## THE USE OF AIR

BY W. S. RANKIN, M.D.

### THE VITAL FLAME

**Energy.**—This term means capacity for work. The human machine is wonderfully endowed with energy. The foot-pounds of work (the raising of a definite weight to a certain height) which it may perform is unknown, but if it is ever computed the figure will be far beyond our present appreciation of the capacity of the body for work. In this connection the daily tasks of certain organs is significant: for the heart the daily task is to pump 1,200 gallons, or sixty barrels, of blood from its chambers, the equivalent of lifting 60,000 pounds to a platform forty inches high; for the lungs the daily task is to inhale and exhale from fifty to sixty barrels of air; for the liver the daily task is, among other things, to maintain a sugar factory for converting sugars and starches consumed as food (the larger part of our diet) into a storable form of sugar—glycogen—and for reconverting the glycogen into sugar as the cells of the body need it for fuel, to make from one to two pints of bile daily, to perform the last rites for 20,000,000,000 red blood corpuscles, worn out and dead from serving the other cells of the body with oxygen; for the bone marrow, the daily task is to replace the 20,000,000,000 red blood corpuscles that have sacrificed

their lives in the service of the social organism, and to enlist, equip, and maintain an efficient and elaborate army of phagocytic cell-soldiers for the defense of the cell-commonwealth.

We could go on citing the more important work of particular organs, but our object is merely to suggest rather than to attempt to accurately compute the enormous amount of energy used by our vital machinery.

**Source of Energy.**—The energy used in the human body comes originally from the sun, and in this wise: the sun warms, vaporizes and lifts the water from the ocean; it changes the temperatures of different places and creates winds, and the winds carry the water to the land. The seed drinks the water from the dust, the water which has dissolved the soluble part of the dust, and thereby builds its structure "out of the dust," and it sprouts and grows. The seed, and the resulting plant, in building the more elemental material of the soil into its complex structure, uses in the process and encloses within its substance the sun's heat and energy. The seed and plant grow to be a tree, and the tree is converted into fuel—wood or coal—and as such attains the object of its existence, to wit, that it might become the vehicle for storing and making available to man the energy of the sun.



**Fuel.**—If the temperature of a piece of wood or coal is raised to a certain degree it burns. In burning, oxygen, one of the gases which constitutes twenty per cent of the air, combines with the carbon of the wood and forms a gas called carbon dioxide. Carbon dioxide passes off as the principal constituent of smoke, which contains in addition some water vapor driven off by the process of burning, traces of a few other gases, and unburned particles of carbon—soot—which gives smoke its color. The essential act in burning, or combustion, is the part played by oxygen. The oxygen breaks into the highly organized structure of combustible material, that has been built up by the plant of atoms or blocks of the elements which the plant took out of the dust; the oxygen tears down this structure and in doing so liberates the heat and the energy of the sun which the plant used in converting the elemental into the higher, more complex substance.

The process of combustion, the union of oxygen and carbon, with the breaking apart of the atomic actors playing lesser roles is not always accompanied, as in the flame, with the crackling, the sparks and the smoke. Often the oxygen goes about its business slowly and quietly, taking months and years to untie the fettered elements, liberating the stored up energy which the oxygen at higher temperature would set free within a few minutes. A tree falls and rots, taking forty or fifty years to return to the dust, but in that slower process of years the tree gives up exactly the same amount of energy and heat as it would have given up in a few hours if burned in a furnace.

**Food.**—Food is plant substance. True, it may be one step removed, that is, plant substance transformed by the cow into milk, or by the steer into beef, or by the pig into pork, but the essential fact, not to be lost sight of,

is that food in its primary, unelaborated form, is plant substance, and as such is fuel, the vehicle of the sun for sending his rays into the innermost parts of our anatomy and for making available his power to the cells of the body for the accomplishment of their task. About eighty per cent of our food is used as fuel in the body, that is, to supply heat and energy; about twenty per cent is used as building material in the growth of the body and is repair material in maintaining its normal structure. At this time we are not concerned with the twenty per cent, but with the eighty per cent that is used for the purpose of fuel. This fuel is thrown into the living furnace through an opening at the back of the mouth, called the gullet or esophagus. In the stomach and intestines it is digested into simpler compounds and made into soluble form, or, as in the case of fats, broken into finely divided particles, so that it passes into the cells of the digestive canal and into the blood stream. The digestive system, therefore, is like a work-shop where the coarser food, the logs and heavy sticks, as it were, are split and chopped into finer pieces, shavings, and even into fiber, for easier distribution to and combustion within the cellular structure of the body.

**The Burning Fuel in the Living Furnace.**—Food, in easily combustible form, distributed to every nook and corner, cranny and crevice, of body and cell, is made to unite chemically with the oxygen of the air that has entered through the respiratory system, and which has likewise been distributed by the blood to the uttermost and most infinitesimal parts of the body. The union of oxygen and the dissolved molecular particles of food, the combusive process, is under the control of the cells. The cells bring about the combination or oxygen with the food through a substance called an enzyme, which they make out of the

foods that are not intended or used for fuel purposes. The cells use the enzyme as a human uses a match to start the fire. The enzyme attaches the oxygen carried in the blood and forms a compound similar to hydrogen peroxide, which one can buy at any drug store. Now, hydrogen peroxide, and the enzyme like it, are supersaturated with oxygen; it has more oxygen than it can carry and is glad to share the oxygen with anything that will take it. So the supersaturated oxygen carrier, the enzyme, comes in contact with the body food, the fuel broken into fine molecular pieces, which is, so to speak, easily ignited; combustion takes place and the heat and energy of the sun contained in the food are made available for the work of the cells. So the mighty sun and the tiniest cell, 93,000,000 miles apart, and in relative sizes still further separated, are in touch, working together toward the eternal purpose of the Power that made them and set them in their places.

**Regulating the Furnace.**—Once a fire is started it may be made to smolder or to blaze brilliantly by cutting down or increasing its air or oxygen supply. We cover the coals with ashes, decrease the air supply, and the fire smolders; we blow it with our breath, or with a fan, or with a hand-bellows, increase the air supply, and the smoldering fire leaps into blaze. The amount of oxygen supplied to burning material determines the rapidity and the intensity of the combusive process. This is not so in the human body. It is not the gas, oxygen, in the blood about the cells and around the fuel that determines the rate of combustion. The amount of oxygen may be increased without hastening the oxidative process in the body. The reason is that the cells, the living substance, and not the oxygen, the dead gas, are in control. The cells determine, and not the oxygen in the blood, the rapid-

ity of the combusive process. The cells do this through the enzyme which they make and the amount of which they determine.

**The Influence of Cold.**—If a warm blooded animal is placed in a chamber called a calorimeter (an apparatus which is so constructed that the carbon dioxide given off by the body may be measured and the amount of combustion determined from the carbon dioxide produced), it is found that as the temperature of the chamber in which the animal is enclosed is reduced from that of body heat,  $36.9^{\circ}\text{C}$ . to  $0^{\circ}$ , the carbon dioxide output steadily increases until at the lower temperature more than twice the amount is being thrown off in a given period of time than was the case at the higher temperature. As the temperature about the animal falls, its fires burn more vigorously to keep its blood warm and, therefore, the carbon dioxide (the smoke) given off increases. Another interesting experiment: If the muscles of a warm-blooded animal are paralyzed by cutting the spinal cord high up in the neck, or if we give a drug, curare, which has the peculiar effect of paralyzing the muscles, and then lower the temperature surrounding the animal's body, there is no increase in the carbon dioxide (smoke) given off from his body and his temperature falls as that of the surrounding air is reduced. Now, putting these two experiments together, we get this information: that with the muscular system intact warm-blooded animals are able to maintain a constant temperature in very cold surroundings; with the muscular system paralyzed, out of commission, warm-blooded animals cannot maintain a constant temperature in cold surroundings. Conclusion: The muscles are responsible for maintaining the constant temperature of warm-blooded animals.

The cold exerts its effect upon the muscles in the following manner: The cold acting upon the skin causes certain nerves to carry impressions to the central nervous system and these nerve centers react by sending impulses to the muscles, causing the muscles to become active in proportion to the intensity of the cold impressions received. Therefore, under the influence of cold, the muscles of the body are firmer, their tone is increased, that is to say, they assume a mild state of involuntary contraction; if the effect of the cold is more pronounced, the activity of the muscle becomes greater, they shiver, if the effect of the cold is still greater, the animal quickens his gait and begins vigorous exercises in order to keep warm. This effect of the working muscle in producing heat has been demonstrated in calorimeter experiments. If a man is placed on a stationary bicycle in a calorimeter chamber and is made to ride the bicycle at a rapid rate, his body throws off six times as much carbon dioxide or smoke as it does when at rest in the calorimeter, the combustive process in his body is six times more vigorous. The voluntary muscles of the body constitute a very large proportion of the body weight. Their increased activity necessarily calls for and utilizes energy. As we have pointed out, this energy must come from the food. To utilize the energy of the food, the muscles must break up the molecular particles of the food, the plant substances, the food which contains the heat of the sun, built into its structure by the growing plant. In the breaking down of the food in the combustion, the sun's heat is liberated within the body and so its temperature is maintained by the increased activity of the muscles.

The increased combustion within the muscles under the influence of cold calls for more frequent stoking

of the furnace, calls for more food. So it is that low temperature stimulate the appetite and we consume more food, especially sugar, starches, and fats—the fuel foods—in winter than in the summer. The inhabitants of the Arctic Zone consume extraordinarily large quantities of fat. Fat, pound for pound, produces 2.3 times more heat than any other food. The Eskimo needs the concentrated fuel to keep him warm under his very cold surroundings.

**The Influence of Warmth.**—With the warmer weather of spring comes "spring fever." We feel relaxed. Our muscles are softer and lacking in tone as compared with the colder months. There is a natural disposition to be quiet and restful. The desire for exercises and work loses its edge, and with this slump in the interest and activity of the muscles there is a loss of relish for food. The appetite is diminished. This all means that the combustive process of the body, furnishing heat for warmth and energy for work, has slackened under the influence of warmth. And with the slower burning fire there is not the same need for fuel, or food, as in the colder weather. After several weeks of the warm weather of spring there comes about a natural adaptation of the body to the warm season. The spring fever is no longer noted. An adjustment of our feelings to season has come about, but the slowing or inhibitory effect of warmth on the vital processes remains although it is not as perceptible to the senses as when first encountered.

**Heat Dissipation.**—If the body produced heat and did not dissipate heat, but accumulated it, the cells or the flesh would be cooked in their own fire. Even in hot climates and in warm weather the body must work and, in working, produces more heat than is needed to maintain a normal



body temperature; hence, the necessity for heat dissipation.

The body throws off the heat produced within it as follows: In excreta, 1.8 per cent of the heat produced; in warm expired air 3.5 per cent; in the evaporated water of the expired air from the interior of the lungs, 7.2 per cent; in evaporated water from the surface of the skin, sweat, 14.5 per cent; into surrounding air by radiation and conduction (as a stove gives off heat), 73.0 per cent. In cold weather the throwing off of heat from the body by radiation and conduction is most active; but in warm weather and in warm climates where the temperature about the body may be almost as high or even higher than that of the body, radiation and conduction becomes less active and less effective, and right here is where sweating, with the evaporation of water from the skin, comes to the rescue. When body heat cannot be sufficiently dissipated by radiation into the surrounding air, when on account of high external temperature or vigorous exercise heat production is greatly increased, sweating begins. The influence of sweating or the evaporation of water from a surface may be well illustrated by a very practical device which is used for keeping babies cool during hot weather. If a sheet of cheesecloth is laid across the baby's crib so that the ends of the sheet on either side of the crib rest in a pan or trough of water, the water is drawn by capillary attraction into the gauze and evaporated, and the temperature under the cheesecloth about the bed is from 10 to 20 degrees lower than in the surrounding atmosphere. The sweat glands of the body, pouring their water upon the skin, from which it is evaporated, act in the same way to keep down the temperature of the body as the wet gauze protects the child. There is an interesting case of a man who was born without sweat glands. He could not sweat and in

warm weather the least exercise would cause his temperature to mount to a fever level.

In cold weather the blood vessels of the skin contract so that the warm blood carrying the heat within the body, as the steam pipe distributes it in the house, has only a minimum exposure to the cold surrounding air, but in warm weather exactly the opposite effect takes place. We are all familiar, for example, with the red skin following a hot application. Warmth causes the vessels of the skin to dilate and to bring more of the blood from the warmer interior parts of the body to the skin, where the blood is more exposed to the cooling air and subject to the cooling effects of radiation and the evaporation of sweat.

**Body Temperature.**—The normal body temperature is the balance between the heat produced and the heat thrown off, and it is a wonderfully constant balance. The temperature of the body, as measured by the clinical thermometer, is 98.4° F. The rectal temperature is slightly higher, 99° F. There is a slight diurnal variation of from one to two degrees in the temperature, the morning temperature around 6 or 7 o'clock being the lowest and the evening temperature about 4 or 5 o'clock, the highest. In persons who work at night and sleep during the daytime, this diurnal variation is reversed. The body temperature of infants is not so constant as that of adults. They are more subject to alterations, to febrile conditions, than adults, moreover, fever in babies may be one or two degrees higher than fever in adults, and should cause no greater anxiety than a relatively lower temperature calls for in an adult. The reason for this is that the balance between heat production and heat dissipation in a child, the heat regulating machinery of the body, has not been adjusted.

## WHY ARE FLIES?

In the beginning let us get clear in our heads that the fly is not a dispensation of Providence. He is the **resurrection**, the **reincarnation** of our own dirt and carelessness. He is merely one of our own insanitary curses coming home to roost. He is a domestic animal. We should not be proud of him. We should not raise him to the level of a pet, but at the same time he is just as much a domestic animal as the dog, cat, or sheep, and he cannot live outside of the special and peculiar surroundings which we and our dirtiness and the dirtiness of our barnyards and our domestic animals provide for him. The fly, *musca domestica*, is absolutely unknown in the uninhabited forests and wilderness, and if there were no *domestica* there would be no *musca* to speak of. To paraphrase the Good Book, "A man's flies are they of his own household"; and if we would clean up and keep clean there would be no necessity to preach any gospel or conduct a campaign against the fly. Everything for his sustenance we have to provide for him. He is the most affectionate and most intimate of our domestic animals. He goes to bed with us; he wakes up in the morning before we do, usually. The bard of Hoboken has touched upon this with his usual felicity

"Early to bed and early to rise;  
There is a reason: the answer is  
flies."

It used to be taught that flies performed the useful and necessary office of scavengers. This argument no longer is worthy of consideration. We now know that while they do consume filth and germs, they almost invariably return to deposit them on our food as part of their dejecta.

But, you ask, are flies utterly useless? What does the Good Book teach us about flies? Does it teach us that flies are for the purposes stated in the foregoing paragraph? No. Flies, we are taught, were used to remind King Pharoah of his wickedness and the uncleanness of his people; to plague him until he would recognize the superiority of his Creator and a race of clean people, such as the great sanitarian, Moses, was leading. Flies today serve for the same purpose they did in the time of Pharoah. Flies cannot breed without filth, and the more filth, the more flies. The great purpose they serve, therefore, is that of an index to the sanitary condition of the town, of the community, of the home in which they are found. The real purpose of the fly, therefore, is to serve as a tormenting, disgraceful reminder of our own uncleanness and filth, and the lesson he will eventually teach us is one of cleanliness, which, after all, is the heart and soul of sanitation. We are inclined to place it even before Godliness, for without cleanliness of surroundings, cleanliness of body and cleanliness of mind and soul how can we have a full appreciation of the spiritual virtues?

### Life History

As previously stated, flies are, first of all, domestic creatures; second, they breed **only in filth** of one kind or another. Flies will lay their eggs upon any kind of decaying, rotten, fermenting and disintegrating material. Howard reports a case where they even bred in a carton of snuff. Flies, like the humans with whom they live; of course have preferences when it comes to choosing a place to live and breed. At laying time the first choice of Madam Fly as a suitable place for

depositing her eggs would be upon a pile of horse manure. Her second choice would be that of human excreta, which of course is the more dangerous of the two, because of the presence in human excreta of the death-dealing germs of typhoid fever, dysentery, and the diarrheal diseases of infancy. In the absence of horse or human excreta, Madam Fly will probably choose the kind of disintegrating filth that is most convenient, from accumulated garbage down to decaying paper and sawdust sweepings. In most communities, unfortunately, she does not have to make a second or third choice, because one of the first two are usually readily accessible.

Flies will begin to breed in the spring as soon as the days begin to be consistently warm. They will continue to breed well into the autumn.

### The Egg

When it comes to laying eggs, it is a great economic loss that hens are not as industrious as flies. Each female fly lays on an average of 120 eggs at each laying time and often-times lays as many as 150. And each female fly may make as many as four deposits, or say 600 eggs by a single fly.

The eggs are very small and glistening white. They are ovid in shape, about one-sixth of an inch long and just a little smaller than an ordinary pin. They are laid in clusters of small size and irregular shape.

The duration of the egg stage in this climate during hot weather is from seven to eight hours. In other words, eight hours after the egg is laid it hatches. The larva, after it emerges from the egg, is commonly known as a maggot. It is extremely active and burrows at once into the substance upon which it was hatched. The larva or maggot remains in this stage about five days. During this time its color changes from a glisten-

ing white to one of a butter yellow. Its skin also undergoes a change and forms a soft shell-like structure. This shell or pupal case again changes its color and becomes first red and then turns to a dark brown, or mahogany color. During this evolution its size is increased about three times. In this stage during hot weather the duration is about five days, when the adult fly emerges, crawls to the surface, and as soon as its wings attain their ultimate texture, the fly begins its life of activity, the time lapsing between the deposit of the egg and the emergence of the adult fly being about ten days. The fly does not grow after it emerges from the puparium.

### Figures Beyond Comprehension

Much of the following information is taken from Howard's treatise on the house fly. The number of generations in this climate developing from April 15 to September 10 would probably be about nine. This number of generations has a direct bearing upon the number of flies in a given community.

"Let us start on April 15th with a single overwintering fly, which on that day lays 120 eggs, and we will have the following table:

April 15, overwintering female fly lays 120 eggs.

May 1, 120 adults issue, of which 60 are females.

May 10, 60 females lay 120 eggs each.

May 28, 7,200 adults issue, of which 3,600 are females.

June 8, 3,600 females lay 120 eggs each.

June 20, 432,000 adults issue, of which 216,000 are females.

June 30, 216,000 females lay 120 eggs each.

July 10, 25,920,000 adults issue, of which 12,960,000 are females.

July 19, 12,960,000 females lay 120 eggs each.

July 29, 1,555,200,000 adults issue, of which 777,600,000 are females.

August 8, 777,600,000 females lay 120 eggs each.

August 18, 93,312,000,000 adults issue, of which 46,656,000,000 are females.



August 28, 46,656,000,000 females lay 120 eggs each.

September 10, 5,598,720,000,000 adults issue, of which one-half are females."

Such figures are far beyond the imagination of the writer. Howard says of the above figures, which are taken from his book:

"They are apt to make one feel hopeless at the thought of attempting to exterminate or to hold in check a creature with such possibilities of multiplication; but it must be remembered

that in the supposed instance upon which we have figured, all of the eggs hatched and all of the progeny have survived, whereas in nature a fly has many chances of death not only between the egg and adult, but as an adult before the period of sexual maturity has been reached." . . . "Does not a contemplation of these possibilities, even with all the possible accidents of nature to limit them, indicate in the strongest possible way, even if the carriage of disease were not considered, the necessity of an effort on the part of people to assist nature in limiting a nuisance to humanity?"

## THE RELATION OF FLIES TO DISEASE

The mention of flies in relation to disease has been made on several occasions, for hundreds of years, but attention was never seriously directed towards the fly as a conveyor of disease in this country until the Spanish-American War, twenty-two years ago.

The dissemination of disease by flies is not a complicated biologic process, but a simple mechanical operation. The fly's structure and habits make of him a dangerous pest. He is born and bred in filth, feeds and lives upon filth and, unfortunately, he visits every variety of food from that refused by swine to the daintiest viands on the banquet table. During his rounds as a scavenger he collects upon his body thousands of bacteria, some of which are harmless, some of which are deadly. His body is covered with fine hairs and bristles, which act as excellent media for the collection of filth as he feeds upon human excreta. His wing even, which looks like the finest gauze, is fringed with hairs and thickly studded with bristles. His six feet, with pads beneath and great claws, and bristles of various lengths and sizes, if they were seen under a microscope would reveal jumbled in among the bristles all kinds of dirt and refuse that the fly is accustomed

to visit. It has been stated that the number of bacteria on a single fly may range all the way from 550 to 6,600,000.

### Typhoid Fever

The fact that flies play an important role in the spread of typhoid fever is no longer challenged.

Typhoid fever is due to the *Bacillus Typhosus*, a small germ that lives in the bowels of human beings.

These germs of typhoid are found in all the discharges that come from people who have typhoid fever, the ones actually sick, and in the discharges of some who have had the disease but have recovered. There is recorded a case of a man who continued to discharge the typhoid germ from his bowels forty years after he had recovered from the disease. A great many people have mild cases of typhoid fever and do not know it. They are not sick enough to go to bed, and the doctor is rarely called to see the case. This mild type is most dangerous, because they probably travel from place to place and do not take any precautions to prevent the spread of the disease.

If the typhoid germ lives only in the bowel of human beings, then for you

to have typhoid fever you must partake of the bowel discharges of some other person. How does this human filth containing typhoid germs get into your mouth? There are just three principal ways: first, through water; second, by personal contact; and third, by FLIES. Of these three, which one is the usual or most common route of infection? Let's reason a bit and see. If the first or the water route were the most common, we would expect the disease to be most prevalent during the winter and spring, when the rainfall is heaviest and the earth is saturated with moisture. If the personal contact route were the most ordinary, then we would expect to have typhoid distributed more or less evenly throughout the year, probably reaching the maximum during the cold winter months, because human contact is about the same throughout the year, probably a little closer during the winter. If the third or the FLY route were the prevailing route of infection, then we would expect to have typhoid most common during the FLY season, from April to September. And that is just what happens. During the winter and spring we have little or no typhoid. But with the coming of hot weather and FLIES come typhoid and dysentery.

If the FLY is the chief factor in the distribution and transmission of typhoid fever, how does he carry the germ and how do we get it from him? The answer to this question goes directly back to the problem that the State is now dealing with, the open-back, insanitary privy. Flies lay their eggs and live only in some form of filth. They prefer stable manure, and next to that they would choose human excrement. They not only live in human excrement, but they feed on it. The entire body surface, and especially the legs of the fly, is covered with fine, stiff hairs so that when a fly lights upon and crawls upon filth,

especially human excrement, his body surface and legs accumulate quite a bit of the excrement which he, of course, brings along with him when he comes into the dining-room at meal time. And as he walks proudly and gallantly about upon the butter, the biscuit, and other food, he, of course, leaves in his wake a small portion of the human excrement he has so graciously brought in. You remember the first thing the fly did yesterday when he so gracefully perched himself upon the butter just as you were preparing to serve yourself a portion? I did not see him, but I know what he did. His first act was to vigorously rub his two front legs, one against the other. And did you ever stop to think why he did it? He did it for the same reason that you use your door-mat, to cleanse your feet before entering the house, to rid his feet of accumulated filth so that he might walk with more comfort. So, if you allow Mr. Fly to use your food as a door-mat to rid his body and feet of the filth, and especially human filth, then you can expect typhoid fever and dysentery and "summer complaint." If you give him an inch, he will take a yard. He will not only use your food and the baby's mouth and face for a door-mat, but as a cuspidor as well. After banqueting upon human excrement containing the germs of typhoid and dysentery, he repairs to the dining-room or to the baby's crib, and after cleansing his feet, his next act is to relieve his stomach of a portion of its crowded contents. The result is "FLY SPECKS." A tiny, black "FLY SPECK" might, in a few weeks time, grow into the black veil of death.

### Dysentery

Dysentery is a disease which is spread in practically the same manner as typhoid. The germs causing it are passed in the body discharges, and the

flies convey them to our food or some other object, we get them on our hands and probably in the mouth. Both typhoid fever and dysentery are most prevalent during the hot weather, because flies are most prevalent at that time.

### Diarrhea in Infants

The infant mortality represents about fifty per cent of the preventable death rate of our State. Sixteen per cent of the total infant death rate is due to the diarrheal diseases of infancy. Just what per cent of these is caused directly by flies it is, of course, impossible to determine, but it is certain that here again the question of "Fly dissemination of disease" plays an important part.

So if you would safeguard your baby, be certain to see that flies do not come in contact with either the baby or its food.

### Tuberculosis

Flies are readily attracted by sputa and feed upon it with avidity. If the sputa is from a tubercular patient, the fly that feeds upon it immediately becomes a dangerous potential disseminator of the scourge of the human race.

Dr. Frederick T. Lord (1904), after a series of long and careful laboratory investigations, reached the following conclusions:

"1. Flies may ingest tubercular sputum and excrete tubercle bacilli, the virulence of which may last for at least fifteen days.

"2. The danger of human infection from tubercular fly-specks is by the ingestion of the specks on food. Spontaneous liberations of tubercle bacilli from fly-specks is unlikely. If mechanically disturbed, infection of the surrounding air may occur.

"As a corollary to these conclusions, it is suggested that—

"3. Tubercular material, sputum, pus from discharging sinuses, fecal

matter from patients with intestinal tuberculosis, etc.) should be carefully protected from flies, lest they act as disseminators of the tubercle bacilli.

"4 During the fly season greater attention should be paid to the screening of rooms and hospital wards containing patients with tuberculosis and laboratories where tubercular material is examined.

"5. As these precautions would not eliminate fly infection by patients at large, foodstuffs should be protected from flies which may already have ingested tubercular material."

### Other Diseases

Flies are potential if not actual carriers of any disease due to a specific micro-organism accessible to the fly in his rounds.

It has been demonstrated that anthrax, ophthalmia, or sore eyes, may be disseminated by flies; and Laforgue, a Frenchman, believed that flies played an important part in the spread of smallpox virus in certain epidemics.

### Preventive Measures

The ideal way to deal with the fly nuisance and danger would be to completely exterminate the pest once for all time, but unfortunately this is not possible at the present time.

The second alternative is to protect ourselves against the pest by every known means. The three measures to be pursued for protection must be along these lines:

1. To prevent the breeding of flies, by destroying their breeding places.

2. To destroy as many flies as possible after they are hatched to minimize further breeding.

3. Screening of homes and places where food is sold or handled.

Levy, of Richmond, believes that 90 per cent of all house flies in cities breed in horse manure, and that very small numbers breed in any other material. If this be true of the city it is equally true of the country homes, because on every farm the favorite



breeding material, horse manure, abounds, while accumulated garbage is not as abundant as in the city. The solution to proposition one would then seem simple—the proper handling of stable manure—but unfortunately no very satisfactory method has yet been devised to prevent the breeding of flies in stable manure.

Various chemical mixtures for the killing of fly larvæ in manure have been advocated, but none of them are worthy of much consideration, because they are impractical either because of their expense or because their application depends entirely upon the vigilance of some individual, and human material is the most fractious of all the elements or their compositions, to deal with.

The best method yet advocated is the proper construction of stables, with a fly-tight manure bin opening into the stable, into which the manure from the stable is placed daily. The stable should be as near fly-tight in construction as possible, with a concrete floor, or floor of wood construction that is impervious to fly larvæ.

### Destruction of Adult Flies

The best method for the destruction of adult winged flies is the fly-tray—not a ten-cent store fly-tray, but a real home-made fly-trap made along the same lines as the small cone-shaped wire trap, but one two or three feet high and twelve to eighteen inches in diameter. The use of fly-traps in homes is not recommended. The place for the trap is out of doors.

For the flies in the house the use of sticky fly paper is recommended. This, together with fly swatters, offers a very effective means of killing those flies that pass the screens.

Various poison chemical mixtures, such as formalin, arsenic, etc., have been advocated, but they have no par-

ticular superiority over the sticky papers and swatters, and have the objection of dead flies falling in every nook and corner of the room. This is particularly objectionable in grocery stores and food establishments.

For the convenience of those desiring to use any of the various poisons advocated, the following recipe is probably the simplest and safest: **Formaldehyde**—a formaldehyde solution of approximately the correct strength may be made by adding three teaspoonfuls of the concentrated formaldehyde solution, commercially known as formalin, to a pint of water.

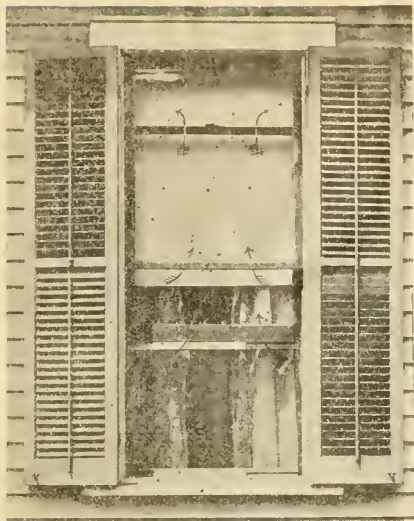
Or three teaspoonfuls of **Sodium Salicylate** (a powder) to a pint of water may be used.



A container such as shown above has been found convenient for automatically keeping the solution always available for flies to drink. An ordinary, thin-walled drinking glass is filled, or partially filled, with the solution. A saucer, or small plate, in which is placed a piece of **white** blotting paper cut the size of the dish, is put, bottom up, over the glass. The whole is then quickly inverted, a match placed under the edge of the glass, and the container is ready for use.

### Screening

The most practical and efficient means yet found for protecting our-



selves against the fly is thorough screening of the home and places where food is handled, from April 1 to December 1. Screens for the entire house, including the back porch where much of the food is handled, should be regarded as much a part of the complete house as the windows and doors are. And if your house is not yet complete, see that the job is finished immediately. Flies have already begun to multiply.

Cheap extension screens are not very satisfactory. They rarely fit the windows or make it fly-tight. They are, of course, quite an improvement over no screens at all. Wire screens protecting the whole window are the best. This way may be tacked over the window, or it may be tacked onto a frame constructed to fit each individual window. If you have to buy the wire, don't get the coarse 14-mesh to the inch; get the 16-mesh wire. The 14-mesh will keep out flies, but will admit mosquitoes. The 16-mesh will prevent the entrance of both flies and mosquitoes.

## WHAT TO DO TO PROTECT YOURSELF AGAINST FLIES

Build a sanitary privy.

Screen your windows and doors. DO IT NOW!

Screen all food, especially milk. Do not eat food that has been in contact with flies.

Keep flies away from the sick, especially those ill with typhoid fever, scarlet fever, dysentery, infantile diarrhea, and tuberculosis. Screen the patient's bed. Kill every fly that enters the sick room. Immediately disinfect and dispose of all discharges.

Catch the flies as fast as they appear. Use liquid poisons and sticky fly papers.

Allow no decaying matter of any sort to accumulate on or near your premises.

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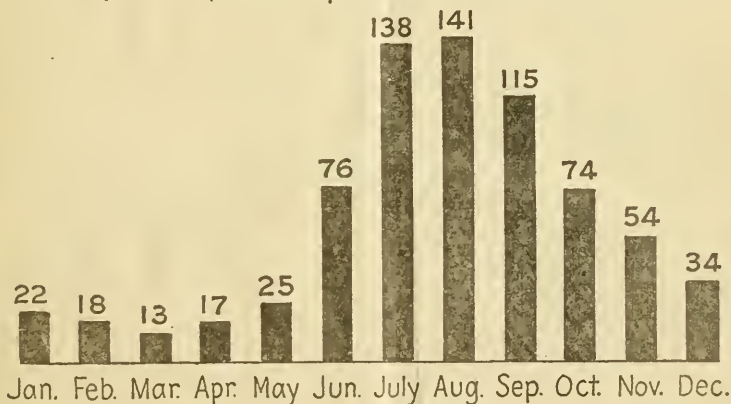
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## MONTHLY VARIATION IN TYPHOID DEATHS

(N.C. average for 4 years)

High rate in summer and fall due largely to flies coming from open-back privies to unscreened houses.



Graphic illustration of manner in which typhoid fever increases as the height of the fly-season is reached.



# CLEAN UP!

"Cleanliness Is Next To Godliness"



Does your  
Back Yard  
look  
like  
this?



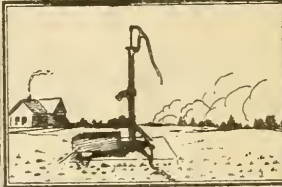
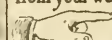
Or  
like  
this?



Open-top  
Wells  
admit  
Filth and  
Drainage.



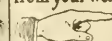
Use a Pump  
with cement top  
and have all  
drainage away  
from your well.



Is  
your Privy  
a  
Disease  
Spreader?



Is it Fly-  
tight, placed  
over a Pit &  
100 yards  
from your well?



Does your  
Kitchen  
look  
like  
this?



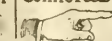
Or  
is it  
Screened  
Clean &  
Convenient?



Dirty,  
Dusty,  
Living Rooms  
cause  
Poor Health



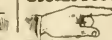
Keep  
the House  
Clean  
Screened &  
Comfortable.



Do you  
buy  
Food  
from stores  
like this?



Or  
do you  
buy  
only  
Clean Food?



## KEEP CLEAN

State Board of Health, Raleigh, N.C.



# The Health Bulletin

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Vol. XXXV

JUNE, 1920

No. 6

## CONQUERING DEATH

---

In North Carolina during the past five years the number of annual deaths from typhoid fever has been reduced nearly fifty per cent. Here is the record:

In 1914.....839

In 1919.....427

There are two reasons for this wonderful record: improved sanitation, primarily through the installation of sanitary privies; anti-typhoid vaccination.

---

**A DEATH FROM TYPHOID IS A  
USELESS DEATH**

**SPECIAL TYPHOID FEVER NUMBER**

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SCARLET FEVER  
INFANTILE PARALYSIS  
CARE OF THE BABY  
FLY PLACARDS  
TYPHOID PLACARDS  
TUBERCULOSIS PLACARDS

CLEAN-UP PLACARDS  
SPITTING PLACARDS  
SANITARY PRIVIES  
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DISPOSAL PLANTS  
EYES  
FLIES  
COLDS  
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PELLAGRA  
CONSTIPATION  
INDIGESTION

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#### *The Baby:*

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Care and Feeding of Children  
Short Talks With Young Mothers  
Care and Feeding of Infants and Children  
How to Take Care of the Baby  
Infant Care

#### *The Child:*

His Nature and Nurture  
Dietary for Children  
Food for Young Children  
School Lunches  
What to Feed the Children  
Hygiene of the School Child  
Child Care

#### *General:*

American Red Cross Text-book  
Home Hygiene and Care of the Sick  
Milk, the Indispensable Food for Children  
Feeding the Family

The Bureau of Public Health Nursing and Infant Hygiene will furnish names of publishers of above upon request.



# THE Health Bulletin



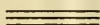
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No. 6

## A SIMPLE PREVENTIVE



Of course no one expects to have typhoid fever. Yet last year in North Carolina more than four thousand people suffered from this easily prevented disease, and 427 died from its effects.

There is a very simple and sure preventive. It is inoculation with anti-typhoid vaccine. It causes no sores, no loss of time. It is safe, almost certain protection. Typhoid has been practically eradicated wherever vaccine has been used. It is convenient, almost painless, and it is furnished free by the State Board of Health.

In a number of counties this summer there will be free dispensaries conducted where the inoculation will be without any charge. In places where free dispensaries are not conducted, the State Board of Health will furnish physicians the vaccine without cost.

Three treatments, one week apart, are necessary. Every one should take advantage of the protection so offered.

# PERSONAL HYGIENE

## THE USE OF AIR

By W. S. Rankin, M.D.

### BREATHING

**Why We Breathe:** As pointed out in an article in the May Bulletin under this general subject, The Use of Air, the energy necessary for the work of the human machine is supplied by a slowly and evenly regulated combustion which goes on continually within the body. The reader will recall that in combustion the same identical chemical change takes place as in burning; that both in and outside of the body this change consists of a combination of oxygen with carbon with the formation of carbon dioxide. Combustion in the body, with the liberation of the necessary energy for the work of the cells, tends to increase the carbon dioxide, or smoke, of the blood.

**The Respiratory Stimulus:** As smoke irritates the respiratory membrane and produces a muscular reaction, a cough or a sneeze, so carbon dioxide, the invisible and the essential element of smoke, accumulating in the circulating blood, acts upon and stimulates a certain part of the brain known as the respiratory center. The reaction of the respiratory center to the carbon dioxide of the blood is a nerve impulse to the inspiratory muscles of the chest with the result that these muscles contract, enlarging the chest and causing an inspiration, or an intake of air.

A decrease in the amount of oxygen contained in the blood, while not the powerful and primary stimulus to the respiratory center that an increase in carbon dioxide is, has a secondary influence in the stimulation of this center that should not be overlooked.

The proof of this statement is that if the percentage of carbon dioxide in the respired air is kept constant and the percentage of oxygen decreased the respiratory center increases its activity as the oxygen supply is cut down.

The explanation of the part played by oxygen in causing breathing is this: the nerve cells which compose the respiratory center form in their normal activity certain waste products of an acid character, just as the body forms, when it is at hard work, sweat. These acids tend to make the respiratory center less responsive, less irritable to the principal respiratory stimulus, namely, the carbon dioxide contained in the blood. The oxygen, by destroying these acid products which lower the irritability of the respiratory center, restores the responsiveness of the center to its normal stimulus, or carbon dioxide.

The primary cause of respiration, then, is the stimulating influence of the carbon dioxide in the blood on the respiratory center in the brain, which is assisted by the oxygen of the blood, playing a secondary role by destroying the acid products of the cells of this center, thereby maintaining its irritability or responsiveness to the carbon dioxide.

**Mechanics of Breathing:** The mechanics of respiration are concerned with the movements of the chest. The chest works on identically the same principal as a bellows. It is a cavity which is enlarged by the muscles of inspiration with the effect of creating a partial vacuum. The vacuum is immediately filled by an inrush of air

through the respiratory passages until the air pressure in the chest is equivalent to that outside of the chest. When the muscles of inspiration cease to act the chest walls drop back in place by force of gravity, a passive movement, diminishing the size of the chest, displacing part of the air, causing it to be expired. Only under unusual conditions (forced expiration in strenuous exercise, in certain diseased conditions, and in acts of straining) is expiration an active process participated in by muscular contractions.

**Size and Shape of the Chest:** The size and shape of the chest changes with the movement of the ribs and the diaphragm. The ribs are hinged in the back to the spinal column, the position of which is fixed. At the end of expiration the ribs have a general direction corresponding to that of the arms when extended with hands clasped on a level with the waistline, the clasped hands corresponding to the breast bone to which the ribs are fastened in front. In inspiration the ribs move upward except in the back where they are hinged upon the immovable spine, and in moving upward follow the course that would be taken by the arms with hands clasped in front on a level with the waistline in being lifted to the level of the shoulders. This movement, as may be well illustrated in the movement of the arms as above suggested, causes the chest to become deeper from before backward and wider from side to side.

The diaphragm is the fan-shaped muscular partition which separates the chest cavity from that of the abdomen. Most persons have observed this muscular partition in slaughtered animals—bees, pigs, sheep and fowls. The diaphragm in expiration vaults upward into the chest; in inspiration it flattens out and descends, pushing downward into the abdomen. The shape of the chest is a rounded, blunt-topped cone, with its base scooped out by the upward

vaulting diaphragm. In passing from a condition of expiration to inspiration the chest is enlarged in all directions, from before backward and from side to side by the ascent of the ribs, and from above downward by the descent of the diaphragm.

**Air Capacity of Chest:** The average chest at the end of expiration contains from 2.5 to 2.8 quarts of air (2500 to 2800 c. c.); in an ordinary inspiration one pint (500 c. c.) of additional air is added, so that at the end of inspiration the average chest contains from 3 to 3.3 quarts of air (3000 to 3300 c. c.). With an extra muscular effort another pint may be inhaled, giving the average chest a maximum air capacity of from 3.5 to 3.8 quarts (3500 to 3800 c. c.).

In ordinary breathing, as has been stated above, a pint of air is inhaled and exhaled. This is spoken of as tidal air. As we breathe about 18 times per minute and respire about one pint per breath we take in and expel from the chest every minute a little more than 2 gallons, or an ordinary water bucket full, of air—about 2 1-2 barrels of air per hour.

**The Mixing of the Air in the Chest:** Inasmuch as the chest contains 2 1-2 quarts (2500 c. c.) of air at the end of expiration and takes in an additional pint with an inspiration, the interesting question of how the new air mixes with and displaces the old air presents itself. In the first place attention should be called to the fact that of the 500 c. c. of air taken in with inspiration about 140 c. c., nearly 1-3 of it, does not reach the lungs, but fills up the air spaces of the larynx, the windpipe and the bronchial tubes. Only 360 c. c. of the 500 c. c. of air gets into the air cells of the lungs, which means that only 3-20 of the air within the air cells, the lung spaces proper, is changed in a respiration. It has been shown, however, that the new air breathed into the lung quickly diffuses itself throughout the air spaces. The experiment of breathing in the harmless



gas, hydrogen, instead of air has shown that after an ordinary inspiration of hydrogen, 170 c. c. of the hydrogen is returned in the first expiration, 180 c. c. in the second, 41 c. c. in the third, and 40 c. c. in the fourth.

**The Lungs:** These organs are two elastic bags contained in the chest and filling up the chest space except that part which is occupied by the heart and the large blood vessels. The lungs are pyriform in shape, base down, resting upon the diaphragm, and apex projecting up behind the collar bone, about one inch into the neck.

In structure the lungs, as has been said, are elastic bags, but instead of being hollow and smooth walled like an air balloon, their interior is everywhere attached to and filled with an elastic, sponge-like texture. When the sack is extended the spaces contained in the sponge are enlarged correspondingly. We may think of the lungs, then, as one large elastic sack filled with tens of thousands of smaller sacks. This arrangement tremendously multiplies the interior surface of the lungs with which the air comes in contact. The total interior surface of the lungs, the combined surface of all the air cells, if it were spread out like a carpet, would cover a space 52 by 24 feet.

**The Respiratory Membrane:** The lining of the interior spaces of the lungs is the respiratory membrane, the membrane through which the blood pours out its carbon dioxide, or smoke, and takes in the oxygen needed for the vital flame. Three-fifths of the structure of this membrane is made up of the richest interlacing network of small blood vessels, or capillaries, that is found anywhere in the body. These capillary vessels are 1-500 of an inch in length and 1-3000 of an inch in diameter—so small that the red blood cells in passing through them travel sheep-fashion, in single file. Between the blood vessels are many elastic fibers which give the lungs their elastic, distensible and contractile property. Covering the network of capillaries and elastic fibers is a thin, delicate membrane 1-100,000 of an inch in thickness. In the act of respiration the air comes in contact with this respiratory membrane 52 by 24 feet in extent and is separated from the blood by only 1-100,000 of an inch.

In the next chapter will be described the process by which the oxygen passes through this membrane into the blood for distribution to the body and the carbon dioxide, or smoke, passes out of the blood, through the membrane, into the lungs for discharge through the nose.

# TYPHOID FEVER—ITS CAUSATION AND PREVENTION

By L. L. Lumsden, Surgeon, United States Public Health Service.

Typhoid fever is a preventable disease. Compared with the other infectious and communicable or "catching" diseases, it is a readily preventable disease.

Practical measures for the prevention of typhoid fever are known. They have been tested in many different parts of the world and in every instance they have proved effective. It is therefore within the power of any community of intelligent persons to fix its own typhoid fever rate.

Though the preventive measures are a matter of definite knowledge, efforts to get the people of the average self-governing community to carry out these measures to a reasonable extent are decidedly experimental in character.

In the United States about 400,000 persons are incapacitated and about 30,000 are killed by typhoid fever each year. Many of the cases occur in persons who are at their period of maximum earning capacity. Thus the Nation suffers from this disease a tremendous economic loss, amounting to many times over what the work required to prevent such loss would cost.

Typhoid fever prevails in practically all parts of the United States. Within the last 10 years few of our communities of as many as 2,000 persons have remained free from this disease for any period of 12 consecutive months. In recent years the rate of prevalence has been for this country, as a whole, from two to five times as high as it has been for some of the European countries. Thus a person living in the average community of the United States is several times as liable to sicken and die from typhoid fever as is a person living in the

average community of some of the European countries. These European countries formerly had typhoid fever rates higher than that of the United States in recent years. Their reduced rates have followed improvements in sanitary conditions.

In many American cities there has occurred within the last 20 years a very wholesome reduction in typhoid fever. Due in large part, apparently, to sanitary improvements in the cities, there has been a material reduction in the rates of prevalence of the disease for some entire States. For the United States as a whole the typhoid-fever rate, according to the available figures, has been reduced within the last 40 years by about 50 per cent. The present rate in this country, however, is about what the rate for some of the other advanced countries of the world was 30 years ago. Thus, in respect to typhoid-fever reduction, this Nation is about a generation behind the times.

Typhoid-fever prevalence depends upon insanitary conditions in respect to the disposal of human excreta (stools and urine). In our rural districts generally, improvement of sanitary conditions in this respect does not appear to have been sufficient to play any considerable part in effecting the reduction in typhoid fever in the United States. That the persons living in a given home or neighborhood in which sanitary conditions are bad, escape typhoid fever in some instances for a period of months or years, is in nowise remarkable; no more remarkable, in fact, than it is for houses occupied by persons careless in handling fire to escape burning, in some instances, for considerable periods of time.

The improvement of sanitary conditions in our rural districts is one of the vitally important problems confronting us both as individuals and as a nation. Good examples are needed. A community in carrying out the reasonable and simple sanitary measures for the prevention of typhoid fever will markedly benefit itself directly thereby and will also set an example by which other communities may profit.

### YAKIMA COUNTY, WASH., AN EXAMPLE.

A remarkable example has been furnished by Yakima County in the State of Washington. That county had had every year, as far back as the records went, a high typhoid fever rate—over three times as high as the average rate for the whole United States. In the summer of 1911 a campaign for improved sanitation was conducted in that county by the United States Public Health Service in cooperation with the State and county health organizations.<sup>1</sup> Practical measures for the correction of the obviously insanitary conditions were recommended by the investigators and were carried out by the local people. As a result, the annual prevalence of typhoid fever in the county, as a whole, was reduced by about 90 per cent. In North Yakima, the principal town and the county seat, with a population of 14,082 in 1910 and of about 18,700 in 1914, the number of deaths from typhoid fever reported each year in the period of seven years including that of the campaign (1911) was as follows: In 1908, twenty-five; in 1909, twenty; in 1910, thirty; in 1911, six; in 1912, four; in 1913, three; and in 1914, two. Of the deaths in 1911, 1912, 1913, and 1914, two, four, three, and two, respectively, were of persons who had contracted the disease elsewhere and who were brought to North Yakima for treatment. Thus in the period

of three years—1912, 1913, and 1914—not a death from typhoid fever of local origin was reported in this once heavily infested locality. In Yakima County, outside of North Yakima, deaths from typhoid fever were reported as follows: In 1910, twenty-five; in 1911, eleven; in 1912, three; in 1913, none.

Sanitary improvements which effect a reduction in typhoid fever in a community usually effect a reduction also in sickness and deaths from other causes. This was true for Yakima County, as is shown in the following table, which presents the number of deaths from all causes reported for the year before, the year of, and the three years after the campaign:

Year	Deaths from all causes		Entire
	North Yakima	Yakima County. <sup>1</sup>	
1910	251	266	517
1911	210	242	452
1912	151	226	377
1913	202	240	442
1914	160	254	414

<sup>1</sup>Exclusive of North Yakima.

Striking as these figures are, they become more so when considered in connection with the progressively increasing population of the county.

Since July 1, 1911, the annual appropriation for health-work administration in Yakima County has been about \$6,500 more than it was for the several years prior thereto. The saving in human health and human life and the prevention of loss both in earnings and in caring for the sick appear to be a reasonably good dividend from this investment.

Such improvements as have been brought about in Yakima County can be effected in any other rural community in the United States, provided the people thereof will take the trouble to inform themselves of the humane and the business aspects of prevent-

<sup>1</sup>Public Health Bulletin No. 51.



ing preventable disease and will apply their knowledge in a common-sense manner.

### THE CAUSE OF TYPHOID FEVER.

Typhoid fever results from the presence of certain little poisonous plants in the human body. These little plants are called "typhoid germs." They belong to the general group of plants known as bacteria. If a piece of a large plant, such as a tree, be broken up into very small particles and these particles examined with a powerful magnifying glass it will be seen that the large plant is made up of variously shaped little bodies, each having a definite structure. These little bodies are known as "cells." In the larger plants these cells are gathered together in different arrangements to make stems, roots, leaves, blossoms, fruits, and seeds. The bacteria exist as separate cells, and thus represent the simplest form of plant life. Bacteria in general are so small that the individuals cannot be seen by the unaided human eye. A glassful of water containing a considerable number of them in each drop may appear perfectly clean and clear. Under the magnification of a powerful microscope, however, bacteria become readily visible.

What bacteria lack in size they usually make up in numbers. Under favorable conditions, as in milk, meat broth, or nutrient jelly, each typhoid germ will divide into two about every 45 minutes, and thus one germ may in a short time give rise to thousands of its kind. If a needle point be touched to a growth of typhoid germs and then dragged along the surface of a block of one of the specially prepared culture media used in the laboratories there will appear in the course of 18 to 24 hours, along the track of the needle, a growth of the germs which is readily visible and which resembles somewhat the growths of ordinary molds and yeasts. In this way the bacteriologist can cultivate

typhoid germs by the pound, or even by the ton, if desired in such amount.

As is true for the larger plants, there are among the bacteria some which are useful to man or can be made so, and others which are poisonous and, therefore, under certain conditions, harmful to man. Most of the bacteria are of the helpful kind, and without them many of our valuable larger plants could not obtain their food from the soil. Typhoid germs are among the poisonous and potentially harmful or disease-producing bacteria.

The origin of typhoid germs is surrounded with mystery neither more nor less than is that of any other form of living matter. If we see a stalk of wheat or corn growing up from the soil we are sure that it has sprung from a seed of wheat or corn. If typhoid germs are multiplying in the body of a person we can be sure that they have come from typhoid germs (seed plants) which in some way have been introduced into the body of that person. Typhoid germs, like wheat, corn, and other plants, do not originate spontaneously; they come by natural descent from others of their kind.

Like other plants, typhoid germs, in order to grow or multiply, must get into favorable soil. It so happens that the tissues and juices of the human body furnish suitable food for typhoid germs. For their continued existence in nature these plants must from time to time get into and multiply in the bodies of human beings.

Typhoid germs reach the human body by being swallowed. Not every person who swallows typhoid germs has typhoid fever. Neither does every person who comes in contact with poison ivy develop an inflammation of the skin. Just why this is the case is not definitely understood. In epidemics of typhoid fever caused by heavily infected water supplies it is unusual for more than 1 out of 10 of the persons who drink the water

to have typhoid fever. As a rule, the proportion is smaller, frequently not more than 1 in 100 of the population exposed. Individual susceptibility to typhoid infection does not appear to be a matter of general health. In extensive outbreaks or epidemics, when many persons presumably are equally exposed to the infection, the disease appears to attack as large a proportion of those in apparently vigorous health as of those in obviously poor general health. It is quite possible for a person who is highly resistant to typhoid infection at a given time to be highly susceptible to it the next year, month, week, or even day. Some persons have two or more attacks of the disease. Therefore one who has had an attack should not for that reason take any unnecessary risk of exposure to the infection. When a susceptible person swallows typhoid germs the germs multiply in the food canal, and from the intestine they invade the blood and are carried throughout the body. In the blood and tissues the germs elaborate a poison, the effects of which on the different tissues and organs of the body give rise to the symptoms of the disease.

### TYPHOID GERMS COME FROM PERSONS.

From the bodies of persons sick with typhoid fever myriads of living typhoid germs are discharged in the stools and urine, and (rarely) some in the sputum. Every typhoid fever patient, therefore, should be regarded as a reservoir of infection and the excreta dealt with as a very dangerous poison (see pp. 15 to 18). If only the excreta from persons sick with the disease contained typhoid germs, the prevention of typhoid fever would be much simpler than it is. It has been found, however, that some persons in apparently good health harbor in their bodies and discharge in their excreta typhoid germs just as do persons who suffer from typhoid fever. Any person who has ever been ex-

posed to typhoid infection may be one of these so-called "carriers." In some persons the carrier state is of short duration—only a few days; in others it is continued for weeks, months, and, in some instances, even for years. "Typhoid carriers" may be (1) persons in the "incubative" period of a few days or a few weeks immediately preceding the definite onset of the attack of fever; (2) persons who have mild, or "walking," cases of typhoid fever; (3) persons recovered from a definite attack of the disease; and (4) persons who have become infected but who have not recently had, and who may never have, definite manifestations of the disease.

There is no evidence that any of the domesticated animals harbor in their bodies and discharge in their excreta the germs of typhoid fever. Man alone appears to be the source of typhoid infection.

We have typhoid fever because we get something soiled or contaminated with human filth into our mouths and swallow it. This is the central fact in typhoid-fever causation. Every person who has typhoid fever has recently swallowed some typhoid germs which have come in some way from the excreta of some infected person.

In view of these facts it is clear that our great safeguard against typhoid fever is to have the excreta from all persons, both the sick and the well, so disposed of at all times that this potentially dangerous matter will not get on our fingers and thence into our mouths, or into the water we drink or the foods we eat, and so be swallowed.

If human filth is prevented from reaching human mouths typhoid fever will be prevented. This is the central fact in typhoid-fever prevention.

The sanitary (cleanly) disposal of human excreta will prevent not only typhoid fever, but also the dysenteries, the hookworm, tapeworm, and roundworm diseases, much of the diarrheas of infant and adult life, and some of the tuberculosis. It will improve

general-health tone and it will furnish a complete safeguard against the spread of Asiatic cholera.

### TYPHOID INFECTION IS SPREAD IN HUMAN FILTH

In some of our cities and towns water supplies grossly contaminated with human excreta are used for drinking purposes without previous adequate purification treatment, and sewerage systems for carrying away human refuse are faulty, inadequate, or even entirely lacking. In our rural districts generally, homes provided with safe water supplies and proper arrangements for cleanly and safe disposal of human excreta are exceptional. Under such conditions there is a frequent interchange of infection between the urban and the rural communities, and it is not surprising that typhoid fever is highly prevalent in both.

If human filth is not properly disposed of, it can be carried in various ways with whatever typhoid or other disease germs it may contain to human mouths. It can be carried by washing rains or by surface drainage into water supplies, truck patches, fruit grounds, and yards of homes where children play; it can be carried, in some instances, for considerable distances by underground seepage into water supplies; it can be scattered about by the feet of persons and by poultry, dogs, cats, rats, and other animals; it can be carried by flies directly to foods for persons; and from time to time it will get on the hands of persons and thence can be carried into water or foods. Water contaminated with human filth, if used for washing milk vessels or other food containers, or if used for sprinkling or washing fruits or vegetables, may carry infection to the foods. Oysters and other shellfish, grown or stored in contaminated water, may convey infection. Flies, the nastiest of all insects, crawl over, feed on, and breed in human filth. From collections of filth to

which they have had access or in which they have bred they carry matter, with whatever infection it may contain, both within and on the surface of their bodies and smear the filth from their feet and bowels on everything they touch. Fingers very slightly but not noticeably soiled with excreta from a typhoid-fever patient or from a typhoid carrier may carry infection directly to human mouths or to food or drink destined for human mouths.

Typhoid germs are very minute bodies. Twelve thousand of them placed end to end, or 36,000 of them placed side by side, measure only about an inch. Hundreds of them may be contained in a small particle of feces or in a small drop of urine. They are colorless and cause no disagreeable odor or taste in water, milk, or in other foods. Therefore water which is clear or milk which is sweet, if contaminated with very small quantities of human filth, such as may be conveyed on a fairly clean looking finger or by a fly, may be teeming with the living germs of typhoid fever.

### LIFE OF TYPHOID GERMS OUT- SIDE THE HUMAN BODY.

Under most conditions in nature typhoid germs outside of human bodies do not multiply, and they gradually die off. If all typhoid germs could be kept out of human bodies for a period, according to the evidence, of only about 18 months, they would cease to exist, except perhaps as museum specimens preserved by laboratory methods for historical purposes.

In water, soil, sewage, or in cesspool or privy contents typhoid germs do not usually survive more than for a few days or weeks. In some instances, however, a small proportion of them may survive in such material for several months, or even for so long as a year. Therefore, in practice, as a rule, the factor of time alone cannot be depended upon to render safe matter which is known or reasonably



suspected to contain typhoid germs. Freezing kills a large proportion of the germs in water, but the number surviving may be ample to cause infection. Therefore ice made from infected water may be dangerous. Septic tanks should not be relied upon to destroy typhoid germs in sewage, because a very considerable proportion of the germs will survive such septic action as septic tanks are usually designed to accomplish. On vegetables, such as lettuce, sprinkled with infected water or grown in infected soil typhoid germs may remain alive for several weeks. They survive drying for a short period, and under exceptional conditions dust may possibly serve as a factor in disseminating the infection. Experimentally it has been found that butter made from infected cream may retain living typhoid germs for so long as 60 days.

Milk is a very important exception among the substances into which human filth containing typhoid germs is liable to be introduced, in that it is a favorable culture medium for the germs. If a small particle of matter containing typhoid germs is introduced into market or home-produced milk, the germs may die off before they do harm; but in some instances they will multiply rapidly, and therefore may become disseminated throughout a large volume of milk. For this reason it is very important to exercise precautions in handling milk, so that nothing soiled to the slightest extent with human excreta will get into the milk or into the milk vessels. A finger or a fly soiled with infected excreta may introduce into a vat or can of milk, at a dairy farm or at a distributing depot in a city, the seeds of infection for an extensive epidemic of typhoid fever. Milk as a medium of typhoid infection is particularly dangerous, because the germs in it are apt to be present in sufficient numbers to infect persons whose resistance might be adequate to destroy ordinary doses

of infection such as are usually conveyed by the other media—water, fingers, etc.

The typhoid germ is, as compared with many other bacteria, easy to kill. The boiling of water will kill any typhoid germs contained in it. The heating of milk to a temperature as high as 140 degrees F. (or 60 degrees C.) for as long as 20 minutes will kill any typhoid germs contained in it. Dead typhoid germs in water or food, unless their bulk is out of all reasonable and usual proportion, will do no harm. Infected stools and urine can, with very little trouble and cost, be rendered free from danger by an intelligent use of either heat or chemical disinfectants. The readiness with which typhoid germs outside the human body may be killed makes typhoid-fever prevention a practicable and a comparatively simple matter.

### PREVENTIVE MEASURES.

Typhoid fever can be prevented by each and all of the following practical procedures: (1) By increasing individual resistance to the disease; (2) by protecting against contamination with human excreta all substances which may reach human mouths, or by subjecting such substances, before they reach human mouths, to some process which will kill whatever typhoid germs may be contained on or in them; and (3) by disposing of human excreta in a cleanly way, so that this dangerous matter, even in very small quantities, will not be spread about by any of the various agencies and in consequence be conveyed, either directly or indirectly, to human mouths.

Increasing resistance.—We do not understand the general conditions affecting the chances for typhoid germs within the human body to live, multiply, and do damage. We know of no particular order of dietary habits which will increase our natural resistance to the disease. Persons after having had typhoid fever appear to

be, with equal exposure to the infection, less likely to develop the disease than do persons generally who have not had typhoid fever.

In recent years a specific method for increasing individual resistance to typhoid infection has been employed. This method consists of inoculation of persons with killed cultures of typhoid germs. Three injections, about 10 days apart, are given under the skin. In the first injection 500,000,000 and in each of the two subsequent injections 1,000,000,000 killed germs are given. The reaction following the injection is usually accompanied with only slight discomfort. It is apparently free from serious danger.

From the reaction against this dead-germ matter protective substances are produced in the body which appear to be identical with those produced in a successful reaction against living typhoid germs in a case of typhoid fever. Antityphoid inoculation, or "vaccination" as it is sometimes called, has been employed extensively in the military organizations of the United States and of other countries. Judging from the results among the military organizations, inoculated persons are, upon equal exposure to typhoid infection, less than one-fourth as likely to develop typhoid fever as are persons who have not been inoculated and who have not previously had an attack of the disease. The average duration of the protection given by inoculation has not yet been definitely determined, but it is supposed to be at least two years. Antityphoid inoculation should not be regarded as a substitute for sanitation. It does not protect against the diseases other than typhoid fever which spread as a result of insanitary conditions. The protection which it gives against typhoid fever is relative, not absolute. It is not to be relied upon to protect against large dosage of infection, such

as appears to obtain frequently in instances of outbreak caused by milk-borne infection. As a protective measure, antityphoid inoculation is especially advisable for physicians, nurses, travelers, soldiers in camps, members in the household of a typhoid carrier, and other persons who are to be unusually exposed to typhoid infection.

#### Safeguarding food and drink.—

Hands possibly soiled to the slightest extent with human excreta should be thoroughly washed before being brought into contact with any foods or beverages for human consumption.

Flies in general, and those in particular which have possibly had access to human excreta, should be rigidly prevented, by screening or other means, from having access to human foods. The fewer the flies the less is the danger from them. Therefore, prevention of fly breeding is a preventive measure against typhoid fever.

Water for drinking and culinary purposes should be obtained, whenever possible, from sources which are not exposed to pollution with human excreta. If water which is likely to be so polluted must be used, it should be subjected previously to some adequate purification process. The boiling of water makes it safe so far as typhoid germs are concerned. By proper filtration processes water, either in large or small volume, if not too heavily polluted, may be rendered safe. By treatment with "chloride of lime" solution<sup>1</sup> most potable waters can be rendered safe. This process of water disinfection has proved to be one of the greatest life savers of modern times. As a method for rendering polluted water safe it is remarkably cheap and it can be quickly applied. A plant for treating the water supply of a large town or city by this process can be installed in a few hours and at little expense. The

<sup>1</sup>Reprint Nos. 225 and 261 from the Public Health Reports: "The Chemical Disinfection of Water."

process can be applied also to a small volume of water such as a bucketful<sup>2</sup> or a glassful.

Milk should be rigidly safeguarded against contamination with human excreta. If this is not done, raw milk is one of the most dangerous foods used by man. All milk which is not known with reasonable certainty to have been kept from contact with soiled hands, contaminated flies, dirty vessels, and polluted water, and so kept free from excretal contamination from the time it has left the cow to the time it reaches the consumer, should be properly pasteurized (by being heated to 145 degrees F. for 20 minutes) before being used as a food by persons.

Garden truck and fruits, particularly those which are eaten uncooked, should be protected against contamination with human excreta. This dangerous matter should not be used as a fertilizer in truck gardens unless it has previously been thoroughly boiled.

Oysters, clams, and other shellfish taken from water polluted with human excreta should be well cooked before being eaten.

**Proper disposal of human excreta.**—Considering the dangers in human filth, the many ways in which this matter can be scattered about, and the difficulties of safeguarding our food and water supplies against dangerous contamination when this matter is scattered about, the sanitary (cleanly) disposal of human excreta is clearly the greatest single measure for the prevention of typhoid fever. This measure to prevent the dangerous spread of typhoid germs from their invariable source, the human body, can be carried out with less trouble and cost than the other preventive measures. It will prevent not only typhoid fever, but also many other diseases which are caused by excreta-

borne infections. It will protect general health. It is, from a strict standpoint of dollars and cents, one of the best investments which any community can make. Under comparable conditions of climate, of soil, and of population density, typhoid fever generally will prevail in proportion to the neglect of intelligent care in the disposal of human excreta.

In cities and towns adequate sewerage systems should be installed to carry away the human excreta, and the sewage should be conveyed by the sewers to a proper place for safe final disposal. In rural communities human excreta can be safely disposed of with less expensive machinery, but greater care from individuals is necessary. A full discussion of the principles involved and of methods to be employed in the safe disposal of human excreta at unsewered homes is contained in Public Health Bulletin No. 68.

### SUMMARY.

1. Typhoid fever is caused by the presence of minute plants, known as "typhoid germs," in the human body and is "catching."
2. Typhoid germs come from persons, and only from persons.
3. Typhoid germs come from persons who suffer from typhoid fever and also from some persons who are in apparently good health.
4. Typhoid germs are discharged from the bodies of infected persons in the excretions from the bowels and kidneys.
5. Typhoid fever is preventable by practical measures which prevent human excreta from reaching human mouths.
6. Proper disposal of human excreta will prevent not only typhoid fever, but also many other serious diseases, and constitutes, for any community, one of the best possible investments.

<sup>2</sup>For treating water in small volume in a tightly stoppered vessel ready for use a solution made by adding 1 teaspoonful of good (fresh) chloride of lime to 1 quart of water. To 2 gallons of water add 1 teaspoonful of this solution and let stand for at least 15 minutes before using.



## MEASURES TO PREVENT THE SPREAD OF INFECTION FROM THE BEDSIDE OF A TYPHOID FEVER PATIENT

"The means by which typhoid fever may be prevented from spreading are very simple, very sure, and their cost next to nothing."—William Budd. Typhoid Fever. London 1873.

"The case of typhoid fever now in your house was caused by the ignorance or the carelessness of some one; don't let your carelessness cause the illness, and maybe the death, of others."—Health Department of Richmond, Va., 1909.

Typhoid fever is communicable from the sick to the healthy. The disease is "infectious," "contagious," and "catching." The germs (the infection) of typhoid fever leave the body of a person sick with the disease in the stools and urine. A number of these germs may be contained in a particle of feces or in a droplet of urine too small to be seen by the unaided human eye. Fingers soiled to the slightest degree with the excreta from a typhoid-fever patient and flies which have had access to such excreta may carry typhoid germs directly to human mouths or to beverages and foods which are subsequently to be swallowed by persons. If excreta from typhoid-fever patients are not properly disposed of they may be carried by seepage or drainage, on the feet of animals, and in other ways to water supplies and to certain fruits and vegetables. Infection in water may be transmitted to milk, oysters, and other foods.

In these various ways the infection proceeding from the discharges of the typhoid-fever patient may be distributed far and wide.

To prevent the spread of infection from a typhoid-fever patient the following measures should be rigidly carried out:

1. Disinfect the stools and the urine (and the expectoration, if there be any) immediately upon their escape

from the body.—Keep constantly in the bedpan or other vessel used to receive the discharges a small quantity of the disinfectant solution. As soon as the stools or the urine are received in the vessel add a quantity (1 to 2 pints) of the disinfectant solution equal in volume to about double that of the excreta to be disinfected. Wipe the soiled parts of the patient first with dry paper and then with paper or a cloth moistened with a solution made by adding one part of the disinfectant solution for use in the bedpan to two parts of water. If cloths are used, they should be either burned or thrown into a vessel containing the full-strength disinfectant solution and afterwards boiled in the solution. The paper which has been used for wiping should be submerged in the disinfectant solution in the bedpan. The disinfectant solution and the excreta should be mixed thoroughly. If there are lumps of fecal matter, they should be broken up, because disinfectants cannot kill germs unless brought into actual contact with them. Cover the vessel containing the excreta and disinfectant solution and let it stand for about one hour before emptying. The disinfected excreta should be emptied into either a sanitary water-closet or a sanitary privy. If neither of these is available, the matter can be either burned or properly buried. If to be buried, a hole or furrow in the ground should be dug especially for the purpose. It should be about 1 foot deep, protected against invasion by animals, and remote from wells, springs, or other sources of water supply. If deposited in the ground, the excreta should be kept thoroughly covered with earth.

After being emptied, the bedpan should be thoroughly rinsed inside and out with the disinfectant. One of the best disinfectants for general use at

the bedside is compound cresol solution. It is comparatively cheap. It keeps well. It can be obtained at almost any drug store. For use in the stools and urine the strength should be 1 part of the compound cresol solution to 50 parts of water, or in the proportion of 1 pint to about 6 gallons. For use on the skin the strength should be one-half of this, or 1 part to 100 of water. Another excellent disinfectant for the stools and urine, and one which is cheaper than compound cresol solution, is chloride of lime solution, made by adding 1 pound of good chloride of lime to 4 gallons of water. If chloride of lime is used, a fresh solution should be made up every day, or if a supply for several days is prepared at one time the solution should be kept in a practically airtight vessel. An ample quantity of the disinfectant solution should be kept in the patient's room, convenient for use at all times. Carbolic acid (1 part to 19 parts of water) and formalin (1 part to 9 parts of water) are thoroughly efficient disinfectants for stools and urine but more expensive than either compound cresol or chloride of lime. If carbolic acid or formalin solutions are used, they should be applied in the same quantity and in the same way as described above for the diluted compound cresol solution. Only disinfectants of recognized efficiency should be used. Some of the patented preparations advertised as "disinfectants" or "germicides" have little or no germ-destroying property. If good chemical disinfectants are not immediately available, the stools and urine may be disinfected with boiling water as follows:

Pour into the vessel containing the excreta an ample quantity (a quart to a half gallon, or at least three or four times as much as the volume of stools and urine to be disinfected) of actually boiling (and bubbling) water.

After the boiling water is added, cover the vessel and let stand for one-half hour before emptying.

2. Disinfect promptly (and certainly before removal from the room) everything which may possibly have become soiled to the slightest extent with either the stools or the urine of the patient.—Scrupulous cleanliness should be exercised to prevent, so far as practicable, the articles in the room from becoming soiled with the slightest (even microscopic) quantities of the patient's excreta. In preparing the room for the care of the patient all unnecessary hangings, draperies, and upholstered furniture should be removed. The room should be clean, well ventilated, and furnished only with articles which may be readily and thoroughly cleansed. Textile carpets and rugs should be removed and replaced, if need be, with linoleum. The room should be freed and kept freed from flies and other insects. Dogs, cats, and other domestic pets should be kept out. The mattress of the bed should be protected from soiling by keeping a rubber sheet or folds of paper (newspapers will do) placed over it and under the bed sheet. It is advantageous to dispense with body clothing for the patient which extends below the buttocks. Bed linen, towels, and other clothes used about the patient should be placed in a tub, wash boiler, or other vessel containing sufficient disinfectant solution to cover them thoroughly, and boiled in the solution before being washed at home or being sent out to be washed. Diluted compound cresol solution (1 pint to 12 gallons of water), chloride of lime solution (2 ounces of the powder to the gallon of water), or carbolic acid solution (6 tablespoonfuls of the 95 per cent acid to the gallon of water) may be used as the disinfectant. Water which has been used for bathing the patient should be disinfected before being thrown out. This

<sup>1</sup>This solution, even after dilution with 2 parts of water, is somewhat irritating to the skin; therefore the diluted compound cresol solution is better for use on soiled parts of the patient's body.

can be readily done by adding about 1 teaspoonful of chloride of lime to each gallon of the water. Spoons, dishes, glasses, etc., used by the patient should be placed in a disinfectant solution and boiled before being washed for further use. So far as is practicable, articles removed from the sick room, even after immersion in a disinfectant solution, should be kept away from the kitchen and dining room used for the preparation of foods for the well members of the household.

3. Have all persons who have been in the patient's room disinfect their hands upon leaving the room.—A basin of disinfectant solution should be kept at all times on a stand or chair next to the door, so that all persons leaving the room can conveniently soak their hands in the solution before going out. This should be required not only of those who have touched the patient or the bedding of the patient, but of all who have come into the room, because the hands may possibly receive infection from touching anything in the room. The attending physician, especially, should set a good example by disinfecting his hands thoroughly upon leaving the bedside. Those who have handled the patient, the bedding, or the bedpan, and so have been especially likely to get infection on their hands, should, before touching foods for themselves or others, and before putting their fingers to their mouths for any purpose, disinfect their hands as follows:

(1) Soak them in the disinfectant solution for at least two minutes.

(2) Scrub with soap and warm water.

(3) Dip again into the disinfectant solution or wash with alcohol (95 per cent) either pure or denatured.

Any one of the following may be used as a disinfectant solution for the hands:

(1) Compound cresol solution, 1 teaspoonful to 1 pint of water.

(2) Chloride of lime, 1 tablespoonful to 1 quart of water.

(3) Carbolic acid (95 per cent), 6 tablespoonfuls to 1 gallon of water.

(4) Bichloride of mercury, 15 grains to the quart of water, or 1 part of the bichloride to about 1,000 parts of water.

The wearing of rubber gloves by those handling the patient is a good additional safeguard. Thorough scrubbing of the hands with soap and water only will do much toward removing the infection from the hands.

4. Have the patient's room thoroughly screened to keep out flies, and kill all flies which get into the room.—All windows and doors should be screened. Mosquito netting will serve for temporary screening. All flies which get into the room should be either caught on sticky fly paper or in traps or killed with "swatters." Flies caught or killed should be burned.

5. Isolate the patient to a reasonable extent.—Although one is not liable to get the disease by breathing the air of the room or house occupied by the patient, persons who go into the sick room may touch infected things and afterwards carry infection directly to their own mouths, or through touching foods, by shaking hands, and in other ways carry infection indirectly to the mouths of other persons.

It is better for the patient and for all other persons in the community for all unnecessary visitors to be kept out of the patient's room. As a rule only those needed in the actual care of the patient should be permitted in the room. If visitors do enter the room they should be required to exercise, under the supervision of the regular attendants, all due precautions while in and upon leaving the room. It is particularly inadvisable to permit children to go into the sick room. If possible to so arrange, the persons attending the patient should have nothing to do with the handling of foods for other members of the household.

6. Continue precautionary measures as long as the discharges from the



person recovering or recovered from typhoid fever are infectious.—Disinfection of the excreta and of all things liable to have become soiled with the excreta should be continued for at least two weeks after the person affected has recovered from all symptoms of the disease, and, whenever practicable, until it has been determined by bacteriological examinations that the excreta no longer contain typhoid germs. Persons recovered from typhoid fever should be especially careful, for at least two months after recovery, about their toilet and about washing thoroughly their hands immediately after going to stool or to urinate.

7. Disinfect the room and all articles in the room upon the termination of the case.—This is not important if the other measures have been carried out thoroughly. Otherwise the room should be fumigated with some gaseous disinfectant, such as formaldehyde or sulphur fumes. Before fumigation the room should be made as nearly air-tight as possible and surface exposure of all things in the room, such as bureau drawers, bedding, etc., secured as thoroughly as practicable. Formaldehyde may be generated conveniently by mixing formalin and permanganate of potassium in a bucket or tub. They should be used in the proportion of 2 pints of formalin to 1 pound of permanganate. One pint of formalin should be used for each 1,000 cubic feet of space and the gas left in the room for at least six hours. After fumigation of the room, the floors, walls, and wood-

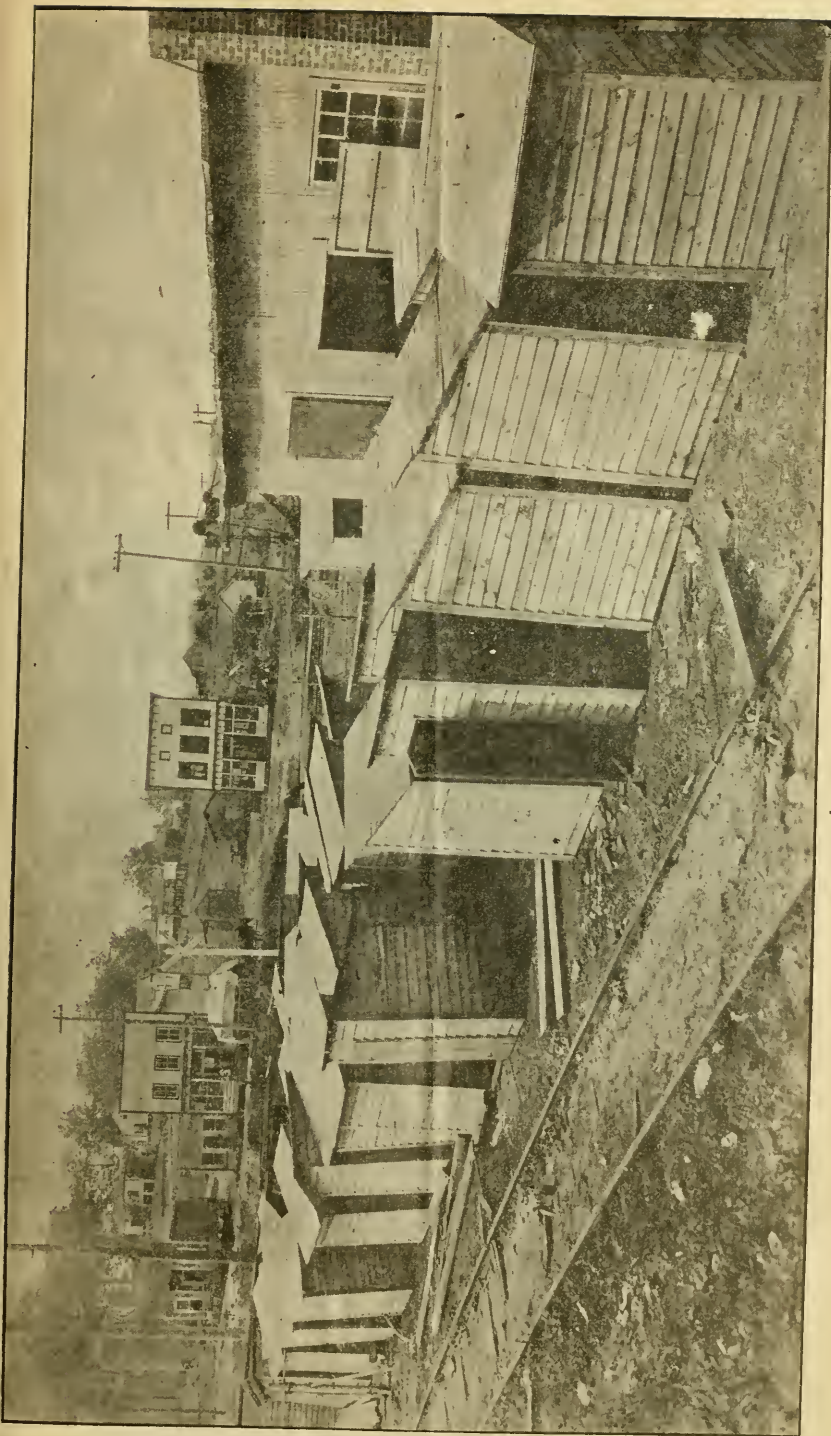
work should be scrubbed with a disinfectant solution, such as chloride of lime solution (strength, 1 to 64) or bichloride of mercury solution (strength, 1 to 500), and the room aired thoroughly and sunned as thoroughly as practicable.

The bed clothes and other textile materials in the room should be soaked in a disinfectant solution and then boiled. The mattress should be burned, soaked in disinfectant solution, or disinfected in a steam chamber. If the mattress has not been obviously soiled with the excreta, it may be rendered reasonably safe after exposure to the gaseous disinfectant by sponging its cover with a disinfectant solution and then keeping it out of doors, thoroughly exposed to sun and air, for about a week.

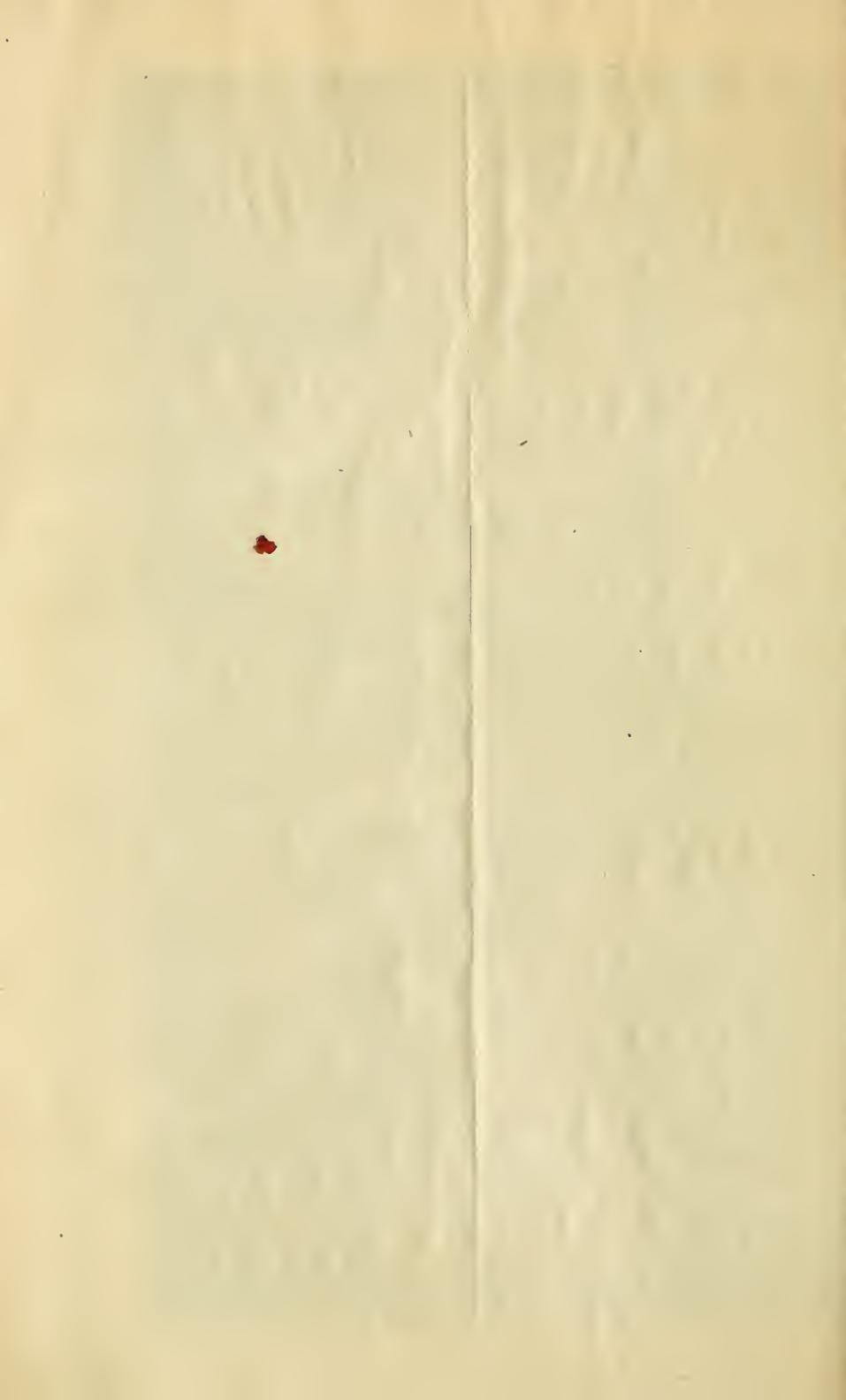
If the proper precautionary measures cannot be carried out in the home where there is a typhoid-fever patient, the patient should invariably be taken for treatment to a hospital or some other place where the precautionary measures can be and will be carried out.

To follow the instructions given in and under the above seven captions is some trouble, but not as much as would be the caring for a second case in the home.

Where such measures are strictly carried out the spread of infection from the typhoid-fever patient will be prevented; where they are neglected the infection may become widespread and cause much needless suffering and loss of life.



SANITATING NORTH CAROLINA.  
Group of Sanitary Privies Being Constructed for Installation at Hillsboro.







# The Health Bulletin

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$$\begin{array}{r} x + 34 = 22 \\ 5x - 24 = 12 \\ 2x + 64 = 44 \\ 18 - 04 = 36 \\ 20x = 10 \\ x = 1 \\ 4 + 37 = 22 \\ 32 = 14 \\ 3 = 6 \end{array}$$

Yes! - But what are they  
learning that makes for happy  
marriage and parenthood?

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# THE Health Bulletin



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## COMMENTS ON THE FEBRUARY HEALTH BULLETIN

The favorable reception given to the Venereal Menace Number of the HEALTH BULLETIN issued last February has been most gratifying. The following are some of the comments made on this number of the BULLETIN and the cause which it represents.

"I believe this movement to be one of the greatest things that has come to North Carolina in the last decade."

"The plan of campaign outlined in the HEALTH BULLETIN, Venereal Menace Number, is excellent. It seems to me, however, that greater stress should be placed on the elementary and secondary schools as a means of suppressing this awful evil. Also, a law should be passed making marriage impossible where either party is not physically fit."

"I desire to say that I most heartily approve of the manner in which the situation is handled in the February HEALTH BULLETIN, and wish to say further that I think the plan of campaign outlined in this number is adequate."

"I have heard the cry and seen the affliction of my people. I hail with delight the fight you are making for their deliverance."

"In my opinion, this bulletin ought to be in our 500,000 homes—every one. I have no doubt it will be shocking, but we need to be shocked in this State and every other on this subject."

"In my judgment, the State Board of Health can do nothing which will benefit the State more than you are doing along these lines."

"We are in receipt of yours of February 27th enclosing a copy of the North Carolina HEALTH BULLETIN and wish to state in the outset we believe the Board of Health is doing a great work in North Carolina through its bulletin and would like to ask that if you have extra copies, we would be pleased to have you forward us 25 or 30 of these that we may distribute them among our employees."

"It seems to me that this BULLETIN would be convincing by its illustrations to every young man and woman of North Carolina if it could only be put into their hands. I sincerely congratulate you on the 'get up' of this new bulletin."

"Allow me to congratulate you on your Venereal Menace Number of the HEALTH BULLETIN. I think it is a splendid get-up. I rejoice to see the publicity that is being given to this subject and I trust you will push it to the limit."

"Your 'Venereal Menace Number' will do more good than anything that has ever been issued by any board of health. For it deals a strong blow at the worst enemy of the civilized world."

"I wish we could put one of these BULLETINS in the hands of every man and woman in the State and get them to read it."

The following comment came from outside of the State:

"I want to congratulate you most heartily on your admirable February number."

"It appeals to the eye and to the mind, and is most convincing and constructively helpful."

"Your bulletins right along are valuable, but this one particularly so."



"I have been thinking for some time that I would write you and express my great appreciation of the work that you and your co-laborers are doing for humanity, and when I read the February number of the HEALTH BULLETIN I could refrain no longer from intruding upon your time.

"The BULLETIN, in my opinion, has gradually been growing more useful each

number, but it strikes me that the February number has about reached the climax. I don't see how it could be better. If only the old as well as the young will absorb, teach and practise the suggestions made therein and make note of the appalling results so truthfully and graphically stated in regard to venereal diseases, I think a world of good would be accomplished."

## Today shapes Tomorrow



For his Tomorrow  
be frank with him Today

# PERSONAL HYGIENE

## THE USE OF AIR

BY DR. W. S. RANKIN, M. D.

### EXCHANGE OF GASES IN RESPIRATION

**Relation of Air and Blood in the Lungs.**—Every minute about two gallons of air and two gallons of blood pass through the average adult chest. The air and blood in the chest spread out over a total area equivalent to a space 52 by 24 feet and are in contact, except for the thin respiratory membrane which is  $1/100,000$  of an inch in thickness. The blood beneath the respiratory membrane flows through a net-work of capillaries. Capillaries are blood vessels  $1/500$  of an inch in length and  $1/3,000$  of an inch in diameter. The combined caliber of the capillaries of the lungs may be imagined from the fact that two gallons of blood passes through them every minute. The respiratory membrane, lying between the air and the blood, may be conceived of as a microscopic net that does not keep the air from actual contact with the blood but that does keep the blood in its place. The important point to remember in this connection is that, practically considered, air and blood in the lungs come in direct contact over a very large surface.

**Changes in the Air in Respiration.**—Ordinary air consists of a mixture of three gases in the proportion of nitrogen 79 parts, oxygen 20.96 parts and carbon dioxide .04 parts. The air which lies in the deeper parts of the lungs, in the air sacs, and which composes the last part of the breath, that is, the air unmixed with the unchanged air which fills the mouth, nose, throat and windpipe, consists of nitrogen 79 parts, oxygen 15.5 parts and carbon dioxide 5.5 parts. It is, therefore, apparent that the air, having come in contact with the respiratory

membrane, or, to be more exact, with the blood flowing through the lungs, has given to the blood 5 parts of oxygen per hundred parts of air and has taken from the blood 5 parts of carbon dioxide (smoke) per hundred parts of air. The two gallons of air which pass through the chest each minute lose approximately one pint of oxygen to the blood and gains one pint of carbon dioxide from the blood. To understand the factors responsible for this exchange of gases we must now learn something of gas pressure and its relation to the absorption of gases by liquids.

**Gas Pressure and the Barometer.**—To appreciate what we mean by gas pressure it is necessary to understand the principles of the barometer. A simple barometer may be made by filling an ordinary cup nearly full of quicksilver; by taking a tube about 40 inches long, closed at one end and filling it with quicksilver; then, with the finger held over the mouth of the tube, invert it, immerse the open end beneath the surface of quicksilver in the cup, bring the tube to a perpendicular position and remove the finger. The quicksilver in the glass tube will stand at a height of about 30 inches above the level of the quicksilver in the cup. The column of quicksilver is maintained by the weight of the air resting upon the surface of the quicksilver in the cup and preventing its displacement upward by the quicksilver in the tube. In short, the column of quicksilver in the vertical tube, which stands 30 inches, or 760 mm.,\* exactly balances the weight of the column of air from 35 to 50 miles high which rests upon the surface of the quicksilver in the cup.

\*NOTE—The abbreviation mm. means millimeter. 25 millimeters make an inch. A millimeter is, therefore,  $1/25$  of an inch. Barometers are graded in millimeters just as thermometers are in degrees. Gas pressure will hereafter be referred to in millimeters, not in inches.

If this simple barometer is carried upward in a balloon or taken to the top of a mountain the quicksilver in the vertical tube falls because we have climbed nearer to the top of the air and the thickness of the atmosphere resting upon the cup is less, which permits the column of quicksilver in the vertical tube to slightly displace the quicksilver in the cup. Of course the reverse effect is observed in descending a mountain or in coming down in a balloon, the weight of the air resting upon the quicksilver in the cup becomes greater as we get under the greater thickness of atmosphere. The same changes in the vertical column of quicksilver occur in dry warm weather and in moist cold weather. In dry warm weather the air resting upon the quicksilver is light and the column of quicksilver falls, whereas, in cold damp weather the air is heavier and the column of quicksilver rises.

**Gas Pressure and Liquids.**—*The amount of a gas absorbed by a liquid is proportionate to the pressure of the gas upon the liquid. If gas pressure on a liquid is raised and lowered the liquid takes on and gives up gas as the pressure rises and falls.* By ascertaining the pressure of a gas upon a liquid at which the liquid neither absorbs nor gives off the gas we find the pressure of that particular gas under which the liquid was at the time it was tested. If a liquid is subjected to a mixture of gases, the liquid absorbs each gas in the proportion in which it exists in the mixture. This last statement assumes that the solubility of the gases, which is dependent upon their chemistry, is the same.

**Gas Pressure in the Lungs and in the Blood.**—The air in the air spaces of the lungs rests upon the respiratory membrane and through it upon the blood with the same weight as the air outside of the body, that is, 15 pounds per square inch of surface, or, in barometric terms, with sufficient weight to hold a column of mercury (quicksilver) at a height of 760 mm. The air in the lungs is a mixture of gases, consisting approximately of nitrogen 80, oxygen 15, and carbon dioxide 5 parts per hundred.

These three gases, in the proportions mentioned, exert the following pressures upon the blood: nitrogen (80 per cent of 760 mm.), 608 mm.; oxygen (15 per cent of 760 mm.), 114 mm.; and carbon dioxide (5 per cent of 760 mm.), 38 mm. Now, by taking the venous blood as it comes to the lungs and trying it out under different pressures for the three gases we find that these gases exist in the blood in the following pressures: nitrogen, approximately 608 mm., oxygen, 37.5 mm., carbon dioxide, 42.5 mm.

Recalling the law for the exchange of gases, to-wit, that a gas under high pressure goes in the direction of the gas under low pressure, we would have: (1) only a very slight passage of nitrogen from the air cells into the blood; (2) a large passage of oxygen from its pressure of 114 mm. in the air sacs to the blood where the pressure is 37.5 mm.; (3) a pouring out of the carbon dioxide in the blood where its pressure is 42.5 mm. to the air spaces where this gas is under a pressure of 37.5 mm. It will be noted, in this connection that, as compared with the difference in the pressure of the oxygen in the air spaces and in the blood, the difference in pressure of the carbon dioxide in the blood and air spaces is relatively slight and the question of how the exchange of carbon dioxide takes place with so small a difference in pressure arises. The explanation is that the carbon dioxide is a more diffusible gas than oxygen, passing through the microscopic pores of a membrane more readily. We may imagine that the chemical particles of the carbon dioxide are very much smaller than the chemical particles of oxygen and, therefore, go through the microscopic sieve more easily.

**Gas Pressure in the Blood and in the Tissues.**—The blood leaving the lungs, freed of its load of carbon dioxide and recharged with oxygen, arterial blood, makes its way through the heart and the arteries, and finally reaches the terminals of the arteries, the capillaries, where it comes in as direct contact with the flesh (the cells, the tissues) as the air had with the blood in the lungs. This will readily be appreciated when one recalls that a



capillary is a vessel only  $1/500$  of an inch long,  $1/3,000$  of an inch in diameter and with a porous, permeable wall about  $1/100,000$  of an inch thick. While the individual capillary is microscopic in its size, the combined opening of all the capillaries is 500 times greater than the caliber of the *aorta*, or the large trunk artery that leaves the heart. This enlargement of the total volume of the blood stream as it gets away from the heart, or pump, accounts for the slowing of the blood as it reaches the capillaries, where its current is slowest, on the same principle that where a stream becomes narrow the water rushes and as it widens out the water moves slowly. This slow movement of the blood through the capillaries, requiring about one second to pass through a capillary  $1/500$  of an inch long, gives time for the exchange of material between the blood and the surrounding tissues. The blood in passing through the capillaries loses 35 per cent of its oxygen. In connection with the slow current of blood through the capillaries it is well to recall the intimate physical relation of the blood to the cells and tissues about the capillary. The blood in the capillary is separated by a porous membrane  $1/100,000$  of an inch thick from the tissues or cells on the outside which, be it remembered, are 80 per cent water and are coated and permeated by microscopic layers and streams of fluid, so that the liquid within the vessel is in touch, through the pores of the wall, with a cell or tissue fluid without the vessel.

The blood, on reaching the capillaries, contains the gases absorbed in the lungs under the same pressures as it left the lungs which are as follows: Nitrogen, 608 mm.; oxygen, 112 mm.; carbon dioxide, 37.5 mm. The tissue juices between and within the cells on the outside of the capillaries contain these three gases under pressures as follows: Nitrogen, about 608 mm.; oxygen, 0, and carbon dioxide from 50 to 70 mm. Under the law governing the exchange of gases and requiring that gas go from high pressures to low pressures there would occur: (1) a slight outflow of nitrogen from the

blood in the capillaries to the tissue fluids; (2) a heavy outpouring of oxygen from the blood in the capillaries to the tissue fluids; (3) a rush of the carbon dioxide from the high pressure in the tissue fluids to the lower pressure in the blood.

With its oxygen given up to the tissue fluids, with an increased load of carbon dioxide taken from the tissue fluids the blood finds the veins and makes its way back to the heart and thence to the lungs where it unloads its carbon dioxide and takes up a new supply of oxygen.

**Hemoglobin and Respiration.**—The physical law which governs the absorption of gases by liquids accounts for the *direction* of the movement of gases between the air spaces and the blood and between the blood and the tissues, but it does not account for the *amount* of the different gases by the blood carried between the lungs and tissues. If this physical law alone were operative, the blood leaving the lungs instead of carrying 1.7 parts of nitrogen, 20 parts of oxygen, and 38 parts of carbon dioxide in each 100 volumes would carry nitrogen 1.7 parts, oxygen .39 parts, and carbon dioxide 2.6 parts for each 100 volumes.

It will be noted that, considering the higher pressure of nitrogen in the air spaces, the amount of nitrogen carried away from the lungs by the blood, as compared with the oxygen and carbon dioxide carried away, is small. Moreover, it is a fact that the amount of nitrogen in the blood before and after it has come in contact with the tissues, that is, the difference in amount of nitrogen in the arterial and the venous blood is practically the same. These two facts, to-wit, (1) the relatively small amount of nitrogen in the blood, and (2) no loss or gain of nitrogen by the blood as it passes through the capillaries, comes in nutritive contact with the tissues, indicates that nitrogen plays a relatively unimportant role in respiration. It is supposed to play the same part in respiration that water in which an active drug is dissolved plays in the administration of the drug—serving only as a diluent.

On the other hand, we observe that the oxygen and carbon dioxide carried away from the lungs by the blood is from 20 to 40 times the amount that would be taken up by the blood if their absorption was due entirely to gas pressure. Evidently another factor is at work. The other factor which is responsible for the large amount of oxygen and carbon dioxide carried in the blood is a chemical substance which composes about one-fourth of the red blood cells and is known as hemoglobin.

Hemoglobin has the peculiar chemical property of forming loose combinations with oxygen and carbon dioxide under the pressure of these gases in the lungs and tissues and of giving off these gases when their pressure in the air spaces or tissues about the blood falls lower than the pressure of the gases in the blood. As the venous blood passes to the lungs the oxygen under a pressure of 112 mm. in the air sacs moves into the blood stream where the oxygen pressure is 37.5 mm.; the hemoglobin under the higher oxygen pressure loads up so that as the blood leaves the lungs it carries in place of the 12 parts of oxygen which it brought to the lungs 20 parts of oxygen; the hemoglobin, carrying its carbon dioxide under a pressure of 42.5 in the venous blood

gives off this gas to the air spaces where carbon dioxide pressure is 37.5; and as a result decreases the carbon dioxide charge as the blood passes through the lungs from 45 to 38 parts for each 100 volumes. The blood from the lungs which reaches the capillaries and comes in contact with the tissue cells and fluids finds oxygen pressure in the tissue fluids 0 and, therefore, gives up its oxygen, which in the blood is under the pressure of 112 mm. to the tissues; the blood finds the carbon dioxide pressure in the tissues from 50 to 70 mm. while its carbon dioxide pressure is 35 and, therefore, absorbs a large amount of the carbon dioxide from the tissue.

The relation of gas pressure to hemoglobin in the exchange of gases in respiration is about as follows: Gas pressure takes the initiative; it starts the oxygen and carbon dioxide in the right direction to and from the blood; it loads the gases as express into the red blood cells which are the box-cars of the cell transportation system. Hemoglobin is the express agent in the red blood cell box-cars that arranges the gases, loosely thrown in by gas pressure, in such a way that the red cells carry from 20 to 40 times as much oxygen and carbon dioxide as would be possible without the agency of hemoglobin.

## CONQUERING AN OLD ENEMY\*

By WILL IRWIN

Two young men, escorting two very nice young girls, once went boating on a Western river. Suddenly they heard muffled shouts from the rapids below them. They looked and saw that a man, swimming, had been caught in the swift current, was going under. The young men rowed toward him. And then, one of the girls began to scream.

"Heavens!" she cried, "we can't take him aboard. He isn't dressed! He's—he's naked!" The other girl joined in the protest. Their escorts, ignoring all this, continued to row. The girls went hysterical. They clutched at the arms of

the rowers. Before that struggle finished, it was too late. The swimmer had gone under for the last time. All this happened, exactly as I tell it, in the Far West when I was a boy.

These were foolish girls, lacking in all sense of proportion. And still, neither you nor I can afford to cast against them the first stone; for this little story is an allegory of the human race. In these United States and in this year of peace 1920, more lives than the whole empire of Great Britain lost during any year of the Great War will be flicked out by two diseases which are curable and prevent-

able diseases. Nor will the year 1920 stand alone. In the four and a half years of intensive warfare between 1914 and 1918, the fifteen civilized nations which fought at Armageddon gave to these twin scourges a heavier toll than they did to bullets, shells, gas, air-bombs, all the ghastly, wholesale killers of modern battle. Yet these two diseases present no mystery to the modern physician. They may be cured; and their infection can be checked at its source. Why, then, have we not acted, we who thought we were civilized? Because we as a world have assumed the attitude of the silly girls in the boat. We have been too nice, too rotten, nasty nice, to organize and come out in open fight against syphilis and gonorrhea.

Even medical science has seemed until lately to struggle against this same handicap of modesty. We have long understood the dangers and horrors of tuberculosis and cancer; but not until the last decade or so has any one known exactly how terrible are the "secret diseases," the "social diseases," the "hidden scourges." At last, we have seen the face of the enemy. The facts which I am about to quote are not the conjectures, guesses, and exaggerations of partisans and alarmists. They are a brief synopsis of cold statistics gathered by calm men of science, proved and approved by our government.

Of the two diseases, syphilis is by far the greater killer—at least directly. In its fatal tertiary stage, it runs into several well-recognized complaints which must, be reckoned in the indictment. Every case of locomotor ataxia, for example, is in origin syphilitic,—there is no other cause for this grotesque and terrible affliction. The same thing is true of paresis. Again, a definite proportion of other fatal diseases, such as certain varieties of organic brain, heart, and kidney diseases, have for origin syphilis. It is estimated by authorities that, together, they kill annually in these United States more than 300,000 people. France we used to say, was "bled white" in the war. She lost about 1,350,000 lives by the fatalities of battle. During the four years and four months of Armageddon,

our tribute to syphilis was about the same as hers to the Kaiser. It causes, year in and year out, two American deaths out of thirteen, leading by a wide margin tuberculosis, which is next on the list. That dreaded "white plague"; heart disease, the terror of declining years; pneumonia, the savage slayer of maturity; the gentle reliever of age; cancer, the dark mystery of science—all give place to syphilis. When we consider that America is on the whole less generally infected than Europe, we must realize that it is the chief enemy of the white race. Again I say: I am reporting not the fancies of alarmists, but the approved facts of cold science.

None of this generation is likely to forget the influenza of 1918. This was a swift, raging epidemic, as syphilis is a slow, persistent one. In that year, when the new plague divided interest with the war, syphilis was quietly taking nearly if not quite as many lives as influenza. The influenza epidemic ran its course in a year, and disappeared; not, probably, to return in such a form for many years. Syphilis goes on the same, year after year. Its percentage of deaths for 1918 was virtually the same as for 1917, 1916, 1915—for every period since medical statistics enabled us to see what it is doing. And unless we act, its death-roll will never diminish.

To finish the indictment against syphilis, no disease worth considering is inherited. The theory of hereditary cancer was exploded long ago. Neither tuberculosis nor, strictly speaking, the tuberculous tendency passes on from generation to generation. But syphilis—stating the matter practically, though not quite scientifically—may be inherited. At certain stages of this long, chronic disease, syphilitic parents transmit the germ to their children before birth. The child so infected may have all the complications of the disease, together with other special complaints peculiar to the second generation.

So much for the dreadful elder sister of this pair. Gonorrhea, although much more common, is far less fatal. It seldom if ever kills directly; it may, however,



lead its victim into certain fatal diseases, and increase the mortality in others. But the statistics on gonorrhea are still so uncertain that we would better leave its fatal effects out of consideration. In modern war, artillery fire kills two men where it wounds three; in actions of a certain kind, rifle and machine gun fire kills one man where it wounds six or seven. Syphilis is the artillery of our hidden foe; gonorrhea is his small-arms. And the wounds and mutilations inflicted by this lesser but more prevalent disease rival the wounds and mutilations of war. Until recently, most of the children blind from birth owed their pathetic affliction to a parent infected with gonorrhea. Modern research into the causes of so-called "female complaints" has brought out appalling facts. Far the greater and more dangerous part of these diseases arises from gonorrhea, and from nothing else. When this kind of "female complaint" has gone far enough, nothing will prevent premature invalidism but a drastic surgical operation. The woman so treated can never again bear children. This is a pathetic feature of the case against gonorrhea. Most of these victims cannot be dismissed with the glib, shallow phrase, "They brought it on themselves." A large part of the pelvic and abdominal operations on women are made necessary by gonorrhea. Many if not most of the women who submit to this operation, which leaves them barren for life, have never transgressed the accepted law of sexual morality—they are paying the penalty for the promiscuity of their husbands before marriage.

However, in striking at the foundations of the race, gonorrhea does not strike through the woman alone. In another manner, equally certain, it produces sterility in males. Syphilis cuts down the trunk of our race; gonorrhea attacks it at its origin. Syphilis destroys life in its full bloom; gonorrhea prevents life.

We Americans, as a people, think a great deal of efficiency. Probably national efficiency has no enemy so powerful and persistent as this lesser of the two anti-social diseases. Except in its more acute early stages or its long, late complica-

tions, it seldom puts its victim to bed. If, like smallpox or typhoid fever, it ran a violent course, killed or passed over in a few weeks, it would trouble us less. The victim goes about week after week, month after month—in the cases where he is not properly treated, year after year—in a state of reduced vitality. The bill is large, owing to the astonishing prevalence of this disease. Though they thought they knew the worst, our army medical authorities were appalled, when they examined our recruits for the late war, by the number of men infected with gonorrhea. Many authorities say flatly that it is second if not the most common of all diseases. One authority estimates that in reduced efficiency it costs us \$300,000,000 a year. This figure, unlike those which I have quoted above, is only shrewd guesswork. Still, few who understand the subject would call it exaggerated.

So much for what they are, these two costly plagues. There would be no use in advertising them, as I am doing here, were the case hopeless. It is far from that. They may be cured. They can, with sufficient effort, be generally eliminated from the race, reduced to the status of the rare diseases. That is the tragedy of the situation. With the weapons long forged and ready, we have meekly submitted year after year to our greatest racial enemy.

How many pock-marked acquaintances have you? Myself, I can call to mind one. How often do you notice on the streets a pock-marked face? Looking back over the past four months, I recall but two. If you had lived a century ago, you would have seen pock-marking as commonly as you now see baldness. Again and again in the biographies of the time—as of Samuel Johnson or Fanny Kemble—you encounter the simple phrase, "he was pock-marked." In those days, smallpox was never entirely quiescent. It killed every year its thousands in small epidemics. Occasionally it burst out into a great epidemic which sent the rich scurrying away from the centres of infection, and slew by the tens of thousands those who must remain. Now, smallpox is so rare that we scarcely take the trouble

to tabulate it among the causes of death. What quelled this scourge? An act of Providence? Not at all. The race took the matter into its own hands. First, medical men discovered, if not yet the germ of smallpox, at least the conditions under which it spread. They learned first, that contact with an infected person and, second, contact with the articles he had worn or used during his illness, might cause the disease. Next, that great pioneer Jenner found in vaccination a sure method of prevention. Then the race went to work. The clothing, the bed-clothing, the dwelling of an infected person were disinfected. We set up hospitals, to which smallpox patients were removed, in which they were kept isolated. Slowly at first, and then with increasing speed, civilized humanity, especially in those places most subject to the disease, took to vaccination. In a generation after Jenner we had controlled smallpox; in a century we have put it behind us. But mark this: the movement went no faster and no slower than public education in the causes and prevention of the disease. Not until every physician knew exactly what to do in the face of an epidemic; not until local mayors, aldermen, supervisors, and boards of health knew that to maintain hospitals, to isolate acute cases, and to disinfect all polluted objects was their solemn duty; not until the dullest person knew that he must instantly report every case, and that he could escape the disease entirely if he got himself vaccinated—not until education and open discussion had established all this did we conquer smallpox.

A generation ago, the warm regions of the American continent trembled under the fear of yellow fever. Science went to work, guided now by a light which Jenner lacked—the germ theory of disease. Our medical investigators found that the germ of yellow fever was transmitted from victim to victim by the bite of a certain mosquito. They studied the habits of this insect; found how it could be destroyed. At first in the semi-tropic parts of the United States, then in Cuba, and later in the more thickly settled parts of South America, sanitary engineers went

to work. Now, unless we grow shockingly careless, yellow fever will never again trouble a well-organized community. Yet here, too, the work went no faster than public education. The governing bodies of states and municipalities, and the public which kept them in power, had to learn that the *Stegomyia* mosquito was deadlier than a rattlesnake, and that they might better poison their wells than leave water-barrels and sewers uncovered and cisterns unscreened.

The same thing is happening to typhoid fever, which used to cause more deaths in armies than the casualties of battle, and which, during the late war, was thrust back into the category of rare diseases. The same thing is happening to bubonic plague and cholera. And always, the plot of the story is the same. Medical investigation finds the germ or the exciting cause. With that clue, medicine goes on to ascertain what conditions favor its spread. It works out remedies, both curative and preventive. It starts a campaign of education and organization. The medical profession and we, the public, move against it as a body—and that war is won. The first battle, the discovery of cause and cure, is usually the hardest. We should be moving now as an organized army of health against cancer, did we know its cause. That, alas, remains a baffling mystery of science.

The first battle against venereal diseases was won long ago. We know that both syphilis and gonorrhea are germ diseases. Their deadly agents have been seen and studied in the field of the microscope. It was Schaudinn who first beheld and described those pale, minute spirals which cause the syphilis plague; it was Wassermann who devised a blood test to find the disease even when it lies dormant in the body. Long before that, we knew all we needed to know about the germs of gonorrhea. And the cure followed. Even when we were still uncertain whether or no syphilis was a germ disease, the doctors understood that a long treatment with mercury, scientifically applied, would arrest—possibly cure. Then came Ehrlich, some eight or ten years ago, with his famous discovery of "606," or salvarsan.

"This," said an enthusiast, "will clean syphilis out of the human system as a reagent will clean the poison out of a reservoir." Salvarsan did not quite live up to this early reputation. But it did prove one of the most valuable healing agents known to medicine. Further, physicians discovered that a combined salvarsan and mercury treatment, expertly and persistently applied, worked wonders. In plain, everyday language, salvarsan held down the troublesome and dangerous symptoms while killing a part of the germs, and mercury cleaned up the rest. Any intelligent physician will tell you that no other chronic disease may be so easily, certainly cured as syphilis—only provided that the patient will stick to a long treatment and start it early.

The story of the gonorrhea cure is not quite so complete and dramatic as that of the syphilis cure. Syphilis is a blood disease, running through the hidden courses of the human system. Gonorrhea attacks the mucous membranes—lies, in a manner of speaking, on the surfaces of the body-channels. Several chemical compounds were known to be deadly enemies of the gonorrhea germ. Long experience showed which of these were most efficient. Medicine discovered mechanical means of getting at those deposits of germs which lie quiescent in the hidden folds of the body, and which make this disease so treacherous. It is not, really, so easy of treatment as syphilis, especially when it occurs in women. But still it belongs in the category of curable diseases provided the skilled physician catches it in the early stages. With both of these plagues, an ounce of prompt treatment is worth a pound of late treatment. Syphilis practically never, and gonorrhea seldom, runs its course and cures itself as do typhoid fever, smallpox, and most epidemic diseases. If neglected, both not only entrench themselves in the system, but they often lead to complications which are virtually incurable.

So the cause and cure were known; the first battle was won. Knowledge of the conditions under which these diseases spread was almost as old as the diseases themselves; and science bolstered that

knowledge with hard facts. The open sewer which spreads venereal disease is prostitution. Most epidemic diseases have some "carrier." In typhoid fever it is infected water or milk, or the household fly. In yellow fever, it is the *Stegomyia* mosquito. In bubonic plague, it is the rat—or rather his parasite, the rat-flea. The fly, the mosquito, the rat of venereal disease is the commercialized prostitute. Whenever we dipped into the underworld in pursuit of knowledge on this subject, we found astonishing figures. Three hundred and twenty Barbary Coast prostitutes in San Francisco were examined during their working hours for syphilis alone. Ninety-seven per cent had the disease! The Baltimore Vice Commission found that of 320 prostitutes in the red-light district, 96 per cent had either syphilis or gonorrhea or both. A similar investigation by the Detroit Board of Health showed 94 per cent. Let us be honest and admit that not every man who goes with these women will catch disease. In certain stages, neither syphilis nor gonorrhea can be communicated, as in certain other stages they most certainly can. Further, not every one directly exposed to venereal disease catches it; but the same is true of other contagious diseases. During the typhoid-fever epidemic at Stanford University some fifteen years ago, four students stopped at a dairy farm; and all had a drink of milk from the same can. This milk was infected with typhoid. None of the four was technically immune, for none had ever gone through typhoid fever; and this was before the discovery of the typhoid inoculation. Two of the four came down with typhoid fever; two escaped absolutely. Smallpox has its stages when it can be communicated and when it cannot; and certain people in certain conditions of the system do not "catch" it, even when exposed. The man who goes with one of these women stands about the same chance to escape undamaged that he would stand if he had spent an hour in the embraces of a smallpox patient, had been bitten by a *Stegomyia* mosquito, or had drunk from a well polluted with typhoid germs.



Step one: find the cause and cure of the disease. Step two: find the conditions under which it develops. Step three: organize and put it out of business. With the medical profession as officers, with state and national boards of health as a general staff, raise and train your battalions, divisions, and armies from us, the people. This last step, though by far the most laborious, is in the typical fight against a disease the easiest of all. To track down a disease to its ultimate cause and to discover the remedy takes genius; and genius is very rare and precious. To organize, when the facts and the remedy are known, takes only the big, wide-thinking, common mind which we use every day in big business and big politics.

But this fight is different. The difficulty is to raise the forces. Just now, the army against venereal disease looks like a general staff and a fine corps of trained officers without sergeants, corporals, and privates. So far, and in the face of the appalling facts which I have quoted above, the eminent and devoted leaders in our struggle against venereal disease have not succeeded in getting the country "heated up" on the subject, as New Orleans got heated up on yellow fever, as we all got heated up on influenza. Why? Because as a general rule the moral, decent, and devoted part of our communities, the very people whom we most need in this endeavor, take the attitude of the silly little girls in the boat. It is a shameful thing; therefore it is not to be discussed. The average newspaper which, until a few years ago, printed for money the obscene advertisements of quacks, shrank from admitting to its columns the words "syphilis" and "gonorrhea," or even the idea of venereal diseases. And this was not so much the fault of the editors as of subscribers, who would stop a newspaper containing "such thoughts."

Public ignorance on this topic is dense, black. Among intelligent, educated, able men of my acquaintance, I find common the belief that syphilis and gonorrhea are one and the same disease, whereas they bear no more relation to each other than

scarlet fever to smallpox. In America, we cannot create enthusiasm without discussion; and we need enthusiasm to arouse that gigantic national will by which America works her marvels.

Yet the general staff has ordered battle with what forces it has, and the organized fight has even now begun. In the late war, the medical officers of every army made a systematic struggle against venereal disease. They had to; left alone, it might have beaten them unassisted by the enemy. Do the best they could, the British Royal Army Medical Corps reported that the venereal diseases kept constantly out of action enough British soldiers to diminish seriously the fighting strength of the army. The war, further, dragged into action and put on a common field the great directing medical men of all the allied nations. On its medical side, it was one long world-convention of great physicians. Before they separated and sailed from France, they had consulted, thrashed out plans to put world-wide team-work into the fight against diseases, especially tuberculosis, gonorrhea, and syphilis. The great Red Cross Conference at Cannes, France, convened in April, 1919. Every day a considerable portion of the time was given to a discussion of the venereal disease problem. Here a general plan of strategy was laid out and agreed on; our delegates returned home to do their part.

I have no room here to describe the plan of strategy laid out by the Red Cross Conference at Cannes; but I will touch upon some of the phases which most concern us. First is the curative campaign.

Until a few years ago, the average man stricken with either syphilis or gonorrhea was a prey first to his own ignorance and second to the quacks. If these diseases stretched a man at once on his back, impotent with fever and pain, they would doubtless be less troublesome to society. But usually he keeps on his feet; he can still go about his business. So a certain proportion of the afflicted applied some patent remedy, always worse than useless, or neglected the early stages altogether. A greater proportion ran to the

quacks. These men, usually physicians without standing in their profession, used to fill the newspapers with display advertisements of "sure-shot" cures. As a class, the venereal quacks were after but one thing—the victim's money. Sometimes they applied, though carelessly and inexpertly, the approved remedies. Sometimes they gave no treatment worth the name, but only hocus-pocus. And usually, when they saw no more money in sight, they applied some temporary alleviant, persuaded the victim that he was cured, and turned him loose. So general and dense was the ignorance about the "secret diseases" and their treatment that the farm-hands and cowboys of the West, for example, believed that a regular physician would not handle a case of venereal disease—that the victim must take to quacks or to patent medicines.

There was a shade of truth in this idea. So disreputable had the quacks made the treatment of these diseases, so nasty nice was the attitude of the public, that general practitioners disliked to take a case of venereal disease. Even yet, they tend to pass it on when they can. And the quack, though long ago shut out from most of the newspapers, is still with us, slaying his thousands. So here is the first movement of the campaign. The United States Public Health Service and State Board of Health, which are officially leading the campaign, want to make it possible and even compulsory for every person afflicted with venereal disease to get good, expert treatment regardless of his ability to pay. Already, many of the larger cities have free venereal disease dispensaries, where, usually, the patient fares better than he would at the hands of a general practitioner, since the staffs of these dispensaries are specialists. The medical profession wants to extend the system until every city of more than 8,000 inhabitants has such an institution. In these days of rapid transportation, they believe this will cover the rural as well as the city population.

Of course, the \$4,100,000 appropriated by Congress, and the funds added from

other federal sources, will not begin to cover the cost of dispensaries. The funds of the American Social Hygiene Association will serve but to aid the campaign of organization and education—the expenses of the general staff. States, counties, and municipalities must do the rest. Already, the authorities of almost every State have responded—some weakly, some whole-heartedly. The weak ones will never put heart into the work until forced by the public. There is the first job for you, John Smith, and for you, the lately enfranchised Mary Smith. The general procedure will be in all States the same. An expert on the treatment of venereal diseases and on the social methods of fighting them will be detailed to the State board of health by the surgeon-general of the United States Public Health Service. He will father the work of the dispensaries. Part of his job will be holding the dispensaries up to the most approved modern methods. From laboratories under governmental supervision, he will get in their purity the drugs necessary to the cure. This is important. Arsphenamine ("606"), for example, requires expert manufacture. It was devised in Germany, and until the war Germany had a monopoly of its manufacture. With the German supply cut off, our chemists had to learn the method. Now the laboratories of America make the best of all remedies; and the product of these laboratories is available for the State and municipal dispensaries.

A closely knit organization encompassing the efforts of all agencies fighting for venereal disease control has been effected through the Division of Venereal Diseases of the United States Public Health Service, for the purpose of meeting the problems in medical service, education, law enforcement, and social service.

Even at this moment, the work has gone far enough so that a victim of syphilis or gonorrhea who is unable to pay a private physician may get in touch with the best modern treatment by writing to his State board of health. How much this spread of scientific

treatment will do to reduce deaths from syphilis, devastating operations on women, blindness, physical defects, and idiocy in children, we cannot even guess. Yet here is a glimpse. Babies of gonorrheal mothers are likely to go blind. At birth, they get the infection in their eyes. Now the surfaces of the eye are easily reached by drugs, and nitrate of silver is almost invariably fatal to the germ of gonorrhea. One by one, our States passed laws requiring physicians and midwives to treat the eyes of all babies, at birth, with nitrate of silver. In the past generation, 80 per cent of blind children were said to owe their affliction to this cause; in this generation, only 20 per cent.

The universal free dispensary will do much toward quelling the old enemy. And still, it is only the lesser feature of the campaign. In a yellow fever epidemic we establish hospitals, staff them with experts, send for the best drugs and apparatus, screen our houses against the fatal mosquito. But that is not enough. If we want to be free from the disease, then and forever, we must get at the mosquito and at the environment where he breeds. So, if we are to succeed in the most important piece of sanitary work ever undertaken by man, we must drain the stagnant swamps of the underworld where flourishes that deadly mosquito, the commercialized prostitute.

That job is not easy; not nearly so easy as draining the swamps, flushing the sewers, and screening the cisterns of a yellow fever district. In New Orleans during the trying days of epidemic, no sensible person who understood the problem was ever in two minds about what must be done. Especially, no one was driven by any natural or unnatural desire to have contact with a *Stegomyia* mosquito. But when we come to attack commercial prostitution we meet a human problem. On the respectable side of society we must deal with diverse views of morals and law enforcement, with whims, notions, fancies, and especially with false modesty. And the prostitute cannot be wiped out with one swat like a mosquito. She is a human being—

sometimes purely wicked, sometimes only unfortunate, sometimes intelligently evil, sometimes merely underbrained—but a human being with a soul and with certain inherent rights. The job is hard, but when did Americans ever hesitate to tackle a hard job? Our gigantic will is our main hold, and "It can be done" our motto. I shall not stop here to dwell on methods. The American Social Hygiene Association is waiting eagerly to explain that. If you will write them, addressing 105 West Fortieth Street, New York, they will give you the benefit of accumulated human experience and governmental cooperation in putting down commercial prostitution and in curbing the diseases which it breeds.

Only, in spite of our national will, our courage in attacking the desperately hard job, we shall never succeed with this one if we maintain the attitude of the silly little girls in the boat. Chambers of commerce, central labor organizations, boards of education, churches, and not least of all, women's clubs, must get sincerely, enthusiastically into the fight. They must educate the public until the dullest yokel knows that a case of venereal disease is as dangerous to himself as a case of smallpox and more dangerous to society in general, that it demands immediate report to the proper authorities, and early, expert treatment, and that the best treatment is to be had for the asking. They must force city governments, sometimes half-compromised with the powers of evil, to drain the swamps and flush the sewers of the underworld. Going further, they must work to replace the low dance-hall, the red-light resort, with innocent and healthful recreation. But they will not do this, they cannot, while venereal disease is a subject only for shameful mention, in blushing whispers, among intimates. The great ally to this most dangerous enemy of the human race is false modesty.

We tingle with pride over our mighty achievement in crowning the Great War with victory. Because all America was working with a common good will, we created out of raw material an army of 4,000,000 men, equipped them, sent them



We've fought  
in the open  
bubonic plague  
yellow fever  
tuberculosis



THE WHITE

THE BLACK PLAGUE

NOW VENER





LOW FEVER  
GUE

VENEREAL DISEASES

# EAL DISEASES

overseas at the rate of 300,000 a month; we raised sums of money beyond imagination; we saved voluntarily from our own tables the food which kept France, Great Britain, Italy, and Belgium from starvation. Could we have done that if we had barred all references to Germany from polite society, if we had mentioned the atrocities in Belgium and northern France

only in shamefaced whispers, if our newspapers had refused to print the name of the Kaiser? The leaders in our fight against venereal disease want to take over for this campaign some of the organized, self-sacrificing enthusiasm which won for us the late war. That enthusiasm cannot live in a democracy like ours without open, high-minded discussion.

## "SOME INF' MATION FOR MOTHER"

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It was evident to the Iconoclast as he came up from the lake with his big string of fish and seated himself upon the steps of the veranda, that he had interrupted a conversation out of the ordinary. Nobody noticed his highly satisfactory catch. The Kindergartner rose as if about to leave, but sat down again. There was a space of somewhat embarrassed silence. Then the Professor, in his most impressive tone, resumed:

"Ignorance undoubtedly is the main, though by no means the only, root of the trouble. Every child should be taught at least the rudiments of the truth about himself or herself; yet in a way so gentle, so gradual, and so tactful that there may be no shock; no rude violation of its natural reserve and delicacy."

"For my part," said the Neighbor, flushed with the consciousness of trespassing upon ground usually forbidden, "I am quite willing to give my little boy this information, but I do not know when, or in what language. I know nothing of medicine." Of course, she meant physiology.

"Oh, but you know about the flowers!" broke in the Kindergartner, in that tone that kindergartners use. "The beautiful story of the fertilization of the blossoms! The bees—"

"No, I don't. And besides, the fertilization, as you call it, that I want to tell him about isn't done by bees."

"I never could understand," interposed the Iconoclast, "why there should be all this intense and even hysterical 'delicacy' about the teaching of sex truth to children. You tell your boys and girls about their teeth and ears and eyes; you make no secret of their digestion, or of the operation of heart and lungs. You even teach these things to them together in

school. But—ye gods and little fishes!—the minute you come to these most important functions of all, you stick your heads in the sand like ostriches, and act as if it were something to be ashamed of. If I had my way—"

"Surely," gasped the Neighbor, "you would not teach such things in public!"

"Well, I don't know. As far as I am concerned, I would teach about sex just as I would teach about chemistry, or spelling. But I understand well enough that I am a barbarian. So I take it from your own point of view, and say that I don't care when or how you teach your little boy or your little girl about this thing, if you only tell it frankly—the plain, ordinary truth, in a plain, ordinary and perfectly shameless way."

"Yes, but the when and the how are everything," protested the Neighbor.

"When the child is old enough to ask, he's old enough to have an honest answer."

"You must conserve the innate delicacy of the child," insisted the Professor.

"I told my little girl," said the Professor's wife, who thus far had been silent, "that this subject must be a secret, a beautiful secret, between us, and that she must never speak of it to any one but me."

"And you told her—"

"All that I thought good for her. I told her in an allegorical way, about the flowers, and the pollen, and the bees, and how the seeds formed."

"Beautiful!" softly exclaimed the Kindergartner.

"How did she take it?" the Neighbor asked.

"She seemed interested, and asked if babies came from bees."

"To which you replied—"

"I promised to tell her more when she was older."

"And meanwhile she is to keep the story of the flowers and the bees and the pollen



as a 'beautiful secret' between herself and you?" The Iconoclast's voice trembled with some suppressed emotion.

"Yes, I prefer that she should not talk about these matters with anybody but her mother."

The Iconoclast rose with a sigh, saying: "Well, I've got to clean these fish or you won't have anything for dinner."

At the back of the house was the big stump of a tree, with a wide board across the top, upon which it was the custom to clean the fish of which the lake furnished an inexhaustible supply. He laid upon it one of the largest, felt the edge of his knife with his thumb, and leaned over to the task.

"What are you doing?" The Professor's little girl ran across the sand to see.

"Cleaning these fish for your dinner, Princess."

"May I watch?"

"Certainly, if you'll keep your fingers out of the way of this sharp knife."

The fish lay open and flat and the knife-point was lifting a great mass of yellow-pink roe.

"What's that?"

"That is called roe; it's made up of thousands of eggs."

"Eggs! How funny! Do fish lay eggs?"

"Oh, yes, indeed. All animals—" the Iconoclast checked himself.

"Where do they lay 'em?"

"In different places, and different ways. Some fish even make nests; I've seen them. But most fish, I think, go up into the shallow water of streams, and lay their eggs on the pebbles of the bottom."

"Do they sit on them, like a hen? How can they—such a lot of them?"

"No, the eggs just lie there in the water until they hatch. The mother-fish doesn't need to keep them warm, as birds do. She just goes on about whatever business she has."

"And never cares what happens to her eggs?"

"I don't think she worries much about them."

Another fish was slit open and laid upon the board.

"Oh, what's that—that white thing? That isn't eggs, like the other, is it? It's about the same shape and size."

The Iconoclast stood up and reasoned with himself. How far was he at liberty to go in answering these simple questions? Was it his business to abash this eager curiosity?

"No," he said at last, "that is not eggs. That is what is called milt."

"What's it for?"

"Well, you see, this is a father-fish. The eggs have to have this milt put on them, or they won't hatch. So after the

mother-fish lays the eggs on the pebbles at the bottom of the stream, the father-fish comes along, and spreads this milt through the water over the eggs."

"How does he know where to find them?"

"I don't know. That is one of the secrets that the fish keep to themselves. Anyway, the father-fish seems to know where to look for them."

"S'posin' he didn't want to lay the milt on the eggs or put it somewhere else. Then there wouldn't be any little fish hatched out, would there?"

"No, there wouldn't. The eggs would just lie there and die. But the father-fish somehow seems to like to do it."

"I s'pose he thinks of the cunning little fish that will hatch out if he does his part. And then he goes away with the mother-fish and they decide what to name their children."

"Very likely," laughed the Iconoclast.

The little girl was silent for a time, watching the deft knife at its dissection; speaking only to identify the father-fish and mother-fish as they came in turn, and laying them side by side in couples.

"I s'pose there are father-birds and mother birds?"

"Oh, yes."

"Do the father birds have milt too?"

The Iconoclast straightened up and rubbed the hinge in his back. Cleaning fish is weary work, when you have to stoop so far. He looked away at the wooded hill across the lake.

"I asked you a question. It isn't polite not to answer. Do father-birds have milt?"

He looked down into the big, clear eyes of the eager little face under the blowing curls.

"Yes, father birds have milt."

"And after the mother-bird lays her eggs in the nest, she goes away and lets the father-bird come in to put the milt on them. Of course, if he didn't, the eggs wouldn't hatch." She said this with an air of conviction.

Then the Iconoclast decided something once for all; stooped over the fish-cleaning again, and said:

"It isn't quite like that with birds. The father-bird puts the milt on the egg before the mother-bird lays it."

"But I don't see—oh, do you mean while it is in the mother-bird's body?"

"Just so."

She was thoughtful for a moment. From the corner of his eye he could see that her brow was knit. Here was a mechanical problem. He wondered how he would put it.

"Well, that explains something!" she cried at last. "I do believe I've seen them

# The simple truth about sex and parenthood



The best antidote for  
vulgarity and misinformation

doing it. Do you know, I never dreamed of it. I thought they were always fighting."

"They were not fighting."

The little girl was thinking again. Presently she asked:

"Did you ever see a cat's egg?"

"No, I can't say I ever did."

"I've always wondered about that. I asked my mother and she said cats were very secret about their eggs."

"Oh, she said that, did she?"

"Yes, and she said I mustn't ask her any more about it. You don't mind my asking you, do you? I'm really very much interested."

"Not at all. I'm glad to tell you anything I know."

"Well, then, tell me this: Where do cats lay their eggs? I'd like awfully to see a cat's egg."

"You're not likely to see one. In the first place, it would be very tiny—too small to see without a microscope, and—"

"But a kitten isn't so very tiny, and I've seen them lots of times, just brand-new, fresh-hatched."

"Ah, but you didn't see the kitten fresh-hatched. The cat's egg never leaves the mother-cat's body at all. The nest where the kitten hatches out is inside of the mother-cat."

The child's eyes were wide with wonder. "Then the teeny-weeny little new-hatched kitten just stays there in the mother till it's big enough to be let out?"

"Exactly."

"Isn't that lovely?"

The Iconoclast is regarded as a hard-core person; but he had not found voice when she added:

"I see now why the mother-cat is so fond of her kitten—she's been it's nest so long!"

"I expect that's one of the reasons."

"Of course, the mother-fish wouldn't care so much; there are so many of hers, and she just leaves them any old way and swims off. Maybe she forgets where she puts 'em. The mother-bird cares more, I s'pose, because she's been sitting on the eggs. But there are two, three, four, five kittens sometimes. Our cat had six, once. Are they all in there at once in the nice, warm, cosy mother-nest?"

"Yes, all in there together."

"How can she tell when they're big enough to be let out?"

"That's a thing nobody seems to know—except the mother-cat. She knows when the right time comes."

"I guess they must get pretty heavy. They do let them out too soon, sometimes; the ones I've seen didn't have their eyes open yet. I should think she

would keep them till they could see and walk around."

"They never have their eyes open when they are born."

"So that's what we call being born! It's just being let out of the mother-nest?"

"That is exactly what it is."

"And is it just the same with dogs, and little calves, and horses, and elephants, and—"

"Just the same."

Silence again. Then:

"But there is one thing I don't exactly understand. After little birds hatch, the mother-bird brings them worms and things. How do the little kittens and elephants be fed in the mother-nest before they are born?"

"While they are in there they are fed from the mother's own body."

"No wonder she loves them!" cried the little girl. "Of course, she knows they're in there?"

"Oh, yes, she—"

"Why, yes, she must. She'd remember when the eggs were fixed so they'd hatch. Of course; that was a foolish question. And they feed from their mother after they are born, too; I've seen them—all the cunning little kittens, nursing in a row."

"Yes, that is one of the differences in animals. The little fishes have to hustle for themselves right away after they are hatched. And the little birds do not nurse; the mother-bird, and the father-bird too, usually, bring them food in their bills, and they stay in the nest until they get their feathers and their wings are strong enough to fly."

"But all the warm-blooded animals bring forth their little ones like the cat, and nurse them until they are able to be weaned, as it is called; that is, to eat something besides the mother's milk."

"Weaned? Why, they wean babies—I heard my mother say so. Is that what it means?"

"That is what it means."

"But I thought babies got their milk from bottles! I know I certainly did."

"Sometimes that is necessary; but most human mothers nurse their babies, when they are able to, just as cats do."

"And do babies come from eggs, and hatch out in the mother-nest, like the warm-blooded animals?"

"They do. Men and women and children are warm-blooded animals. The baby stays in the mother-nest until the time comes for it to be born, just as the kitten does."

"Isn't that beautiful? Now, why didn't my mother tell me that when I asked her? She said it was a terrible secret, and that I mustn't talk about it to anybody else but her, and then she told me



about flowers and pollen and bees, and I got all mixed up. I couldn't see what bees had to do with babies—except to sting 'em."

"They have nothing to do with babies, as you say," the Inconoclast said, "but a great deal to do with flowers. If you will just remember that the pollen that the bees carry from one blossom to another is for exactly the same purpose as the milt of the father-fish, you will understand better."

"Do you mean that the flower-seeds

wouldn't grow without the pollen that the bee brings?"

"That is it, Princess."

The little girl's brow was knit again, and there was real trouble in her voice as she said:

"It seems funny to me that my mother didn't know how babies come. She certainly had me!"

Suddenly she started away toward the house, saying:

"I thank you very much. You'll have to 'xcuse me, now; I've simply *got* to give my mother some inf'mation!"

## HOW A GIRL CAN GUARD HER HEALTH

Every girl loves a strong, healthy baby. The sight of a fat and happy infant crowing and kicking in his crib rouses dreams of the future, when she hopes to have such a precious possession for her own; for the spirit of motherhood has been planted by nature in the heart of every woman and girl and makes her instinctively stretch out her arms to take in those wee mites of humanity who are just getting their first glimpses of a strange and wonderful world.

Is there anywhere on earth a finer baby than the American baby? Look about you and see on all sides these many happy, healthy little ones. Then hear those harrowing tales of sickly, underdeveloped babies born in war-ravaged lands across the seas.

It all makes you feel extremely fortunate to be an American girl, who some day will bring American babies into the world to grow up as loyal, stalwart American citizens.

Now think a little more deeply.

Why have many babies born in recent years in territory occupied by hostile troops, or in countries whose health was sapped by food shortage and overwork, been weaklings?

Why have so many of them, with too little vitality to sustain them, given up their fight for life after a few months?

One important reason is that the mothers, because of war conditions, had

lost the vitality and strength necessary to produce healthy children.

In that fact lies the point at which we are aiming. The Great War showed, as we never before had it demonstrated to us on so large a scale, that a woman must be strong and healthy to be a mother to strong and healthy children.

The woman whose health has deteriorated must expect to have babies who will start life as weaklings and not as healthy American babies.

Motherhood, of course, important as it is in the life of woman, is not her only function.

The war is fresh in our minds, with its splendid record of willing, loyal service rendered by American women, both overseas and at home.

And here again the lesson of health is prominent.

Every woman worker who went to France had first to present a doctor's certificate guaranteeing her soundness in health. Women unfit for the strain of overseas work were rigidly barred out. Many brave women, eager to serve, were prevented from doing so because in previous years they had given too little attention to their health.

On this side of the ocean, too, only women whose health was good could stay to the finish through long hours of tedious labor in canteens, in Red Cross work-

rooms, on farms and in factories where women took the places of men sent out to fight.

### Why You Need Health

In these after-war years, in the work of rebuilding, there is no place for the slacker—man or woman. In the office, the school, the household, the shop, the factory, the American girl must give the best service that is in her. She cannot do this—cannot prove herself worthy of that heritage of honor handed down by the women who helped win the war, unless she keeps herself in the best possible physical condition.

The American girl has a double reason to guard her health, as she does her duty in the work of the world, and meanwhile looks forward into the future and sees visions of chubby, rosy-cheeked American babies nestling in her arms.

With health and happiness as your birthright, it is an honor and a privilege to be an American girl. Preserve and increase this birthright. This booklet seeks to aid you in this, by outlining some of the things you should know and should do to keep in that condition of physical fitness which should characterize the true American woman.

### Relation of Sex to Health

Health and endurance depend largely on healthy sex organs. Until recently there has been silence and secrecy in matters of sex, so that women and girls have not known the close connection between the proper care and use of the sex organs and general health, and the connection between their own health and the health of future generations.

Sex is one of the most fundamental things in life. It is that which makes a man a man, and a woman a woman.

The change from girlhood into womanhood comes with the "waking up" and growth of her sex organs, and at this time a secretion begins to develop in the ovaries which is carried through her body, and adds to her strength and brain power. The outward sign of this growth is the beginning of menstruation, or the monthly flow of blood. From this

time on the girl changes gradually from the awkwardness of her early teens into the graceful, attractive period of young womanhood.

The growth of a boy into a young man at about the age of fourteen is due to the growth and changes in his sex organs. His sex glands also secrete an exceedingly important substance which is absorbed into his blood. The blood carries this substance or secretion all through his body, into his muscles and into his brain. It gives tone to his muscle, power to his brain, and strength to his nerves.

It is sex, therefore, which makes possible the attainment of manhood and womanhood.

And sex is the means of creating life itself. "The most fundamental thing in the world around us is life; the most fundamental thing in the spiritual life to which we aspire is love. The beginnings of life and the beginnings of love are in sex."

### How a New Life Begins

The new life begins with the union of the egg cells of the mother and the sperm cells of the father. In order to understand this process every girl should know the plan of her sex organs. The outer opening leads to a tube which is known as the vagina, and the vagina connects with a small hollow organ which is called the womb or uterus. It is in the uterus that the unborn child develops. On either side of the uterus are two tubes, called the Fallopian tubes, which connect with the ovaries. The ovaries are no larger than an almond, but they contain thousands of egg cells or ova.

Periodically an egg cell leaves the ovary and travels down the connecting tube (Fallopian tube) toward the uterus, and if it does not eventually meet the male or sperm cell, passes out through the uterus and the vagina.

These male or sperm cells, which are similar to the egg cells of the mother, are made and stored in the sex glands of the father. When sperm cells are placed in the vagina by the organ of the father they move up rapidly through

the vagina and uterus to meet the egg cell. If these cells meet, the two unite.

The new cell, which is part father and part mother, passes into the bag-like uterus, becomes fastened to its side and begins to grow into a child. After nine months growth it is time for the child to be born, and it is forced down through the vagina to the outer world.

At about the time the ovum leaves the ovary, an additional supply of blood is sent from other parts of the body to the uterus. If it is not needed it passes out through the vagina. This monthly flow of blood is called menstruation. If a new life has been formed, the blood stays in the uterus and the flow of blood is not experienced again until after the birth of the child.

### The Need for Health

Menstruation is thus closely connected with the main purpose of the sex organs, which is to produce new life. In order to avoid serious illness due to disorders of these organs, a girl owes it to herself and her future children to guard her health carefully during the menstrual period.

### Exercise and Rest

Although there should be no suffering at this time, as a matter of fact many girls do feel pain or feel badly in other ways. In case of pain, it is wise to walk less and rest more. This, of course, applies only to the period of menstruation and the time immediately before and after.

*Exercise and healthful living at other times are the best preventives against suffering at the menstrual period.* A certain amount of outdoor exercise is needed for the development of a strong, vigorous and attractive body.

Girls who are in offices, shops or stores may find it difficult to take enough exercise, but when an effort is made to secure it regularly, its advantages and pleasures will be realized. In many cases the problem is solved by walking to and from work instead of taking a car. There can be no pleasanter way of spending parts of Sundays and holidays than walking or "hiking" in the country and suburbs.

### Rest and Diet

At the time of menstruation, even more than ordinarily, a girl needs from eight to nine hours sleep with windows wide open and a diet consisting of wholesome and easily digested food. It is important at all times to keep the bowels well regulated, but particularly so just before and during the period of menstruation. Pain often results because the lower bowel is packed and presses against the uterus at this time when it is in a sensitive state.

### Bathing

Bathing at the menstrual period is a benefit to the health as well as being necessary to comfort. As at all other times, warm water should be used at least once a day during the time of the menstrual flow for the purpose of cleaning the external parts of the organs. Cold baths, however, or any extremes of temperature should be avoided at this time. Cold water, or a sudden draft of cold air, causes shock and may stop the flow of blood, resulting in an inflammation within the uterus.

### Clothing

The reason for avoiding tight clothing, especially tightly-laced corsets and other tight bands about the waist, is that they press against and displace the sex organs. Pain at the time of menstruation is only one of the ailments which may result from such a displacement.

Narrow or high-heeled shoes, if worn constantly, cause muscle strain, interfere with the circulation of the blood and the unnatural position into which they throw the body tends to disarrange the position of the reproductive organs. In these days of "sport shoes" it is easy to find low-heeled shoes, attractive as well as practical, for street wear at least.

Irritation of the external sex organs, caused by improper clothing, uncleanness or some abnormal condition, may lead to the habit of handling these organs improperly (self-abuse). If this irritation cannot be relieved by proper bathing and proper clothing, a physician should be consulted. Such a habit, if formed, should



be broken at once. It may be followed by nervous disorders, together with lessened self-respect. To overcome a habit once formed, will-power and self-control are required. The mind should be kept busy with thoughts on healthy subjects and away from sexual ideas. Good physical health must also be maintained.

### Posture

Correct sitting and standing (posture) is of the greatest importance to the health of the reproductive organs. Few people realize that round shoulders and slouching positions force downward such organs as the stomach and intestines so that they press upon and force out of place the reproductive organs. Not only unattractiveness but headache, disturbances of the digestive and breathing organs, as well as a great many other disorders, have been due in many cases to poor posture.

The essentials of a correct standing position are (1) chin in, (2) chest up, (3) waist in, and (4) weight on the balls of the feet. Of these the most important are "chin in" and "chest up." "Chin in" means that the chin is held in on the level, tilted neither up nor down. When the chin is kept in and the chest up, the stomach and intestines are pulled up into place and the proper amount of room is left for the reproductive organs.

Aside from all questions of health, think of the attractive, erect girl who carries herself with ease, and who, by her very appearance, inspires the confidence of her employer and friends. Almost every girl can secure this valuable possession for herself.

### Health is Always an Asset

Although care at the time of menstruation is especially needed for the good health of the sex organs, that is not all. Anything which is an aid to complete physical well-being will tend to add health and strength to the organs of reproduction.

If in spite of all attempts to keep strong and healthy, a girl becomes sick, she should not fail to see a doctor. Prompt

attention to a slight sickness will sometimes prevent serious illness.

General good health is a great asset. The popular girl of today is the girl who glows with life, who can swim or dance or play tennis; who has plenty of energy for fun after putting in an eight-hour day, or can keep up with a man on a hike, unhampered by wobbly heels and tight clothing.

This is the American girl. She is not only able to endure long hours in factory, camp or hospital, with their accompanying strain; she is the whole-souled, level-headed, high-spirited companion of men.

### The Sex Instinct

We have seen that sex is the basis of the renewal of life. It is also the most fundamental thing in love. Love is often used as the word to describe the strong attraction between men and women. This attraction is due, in large part, to the sex instinct.

Sex underlies also the love of mother and child, of husband and wife—even friendship, to a great extent, is an outgrowth of sex.

The sex instinct is as normal, natural and necessary an instinct as self-protection. Just as the feeling of hunger for food has been given us that we may know when to eat and thus preserve life, so the sex instinct has been given us in order that we may create life.

Like any other instinct, it is evil only when it is misdirected and uncontrolled. One way in which human life differs from animal life is that men and women have the power to choose how they shall use the sex instinct. Its highest and finest possibilities can be reached only by directing it toward the building up of a home and of a family.

Marriage has been accepted after centuries of experience as the best method of carrying on life, both for the individual and for the race. A man or woman who acts in a way which may bring children into the world without provision for a respectable home or proper care, performs a cowardly act. Such a man or woman is called immoral by the public.

If, moreover, the sex impulse is used selfishly for the sake of physical pleasure, for any other selfish gain, or even to give pleasure to another, the opportunity for the highest and finest love in life is lost.

### The Single Moral Standard

It is true that the world has formerly excused sexual immorality in men while insisting upon purity in women. One reason is that the sex instinct is more easily aroused in most men than in most women. The stronger feeling is due to one of nature's measures for promoting new life. Since the egg-cell of the mother is in readiness only at infrequent intervals, the sperm cells must always be in readiness to unite with the ovum in order that it may not be lost.

But we are beginning to face facts, and no longer excuse men who do not control their sex impulses. Physicians tell us that sex union is not necessary to the health of men, as many people used to believe. This was one of the important lessons taught to every American soldier by order of the Government during the war. Any man who claims that sexual intercourse is necessary to his health is ignorant of the facts or else is using the lie basely to induce some girl to sacrifice herself for his pleasure.

There is no longer any excuse for a different standard of morality for men and women.

Women and girls are to a great extent responsible for setting and maintaining a new standard.

In the first place, they must demand clean living from the men of their choice, and, in the second place, they must help them by avoiding actions which arouse this natural but dangerous impulse and make it difficult for them to control their conduct.

Many girls thoughtlessly stimulate the sex emotions of their men friends by careless words, familiar acts, and too thin or otherwise "suggestive" and conspicuous clothing.

A girl, sure of her own self-control, may see no harm in indulging in a flirtation, but she may not be aware how greatly she is arousing the feelings of the

man and making herself responsible for his temptation and mistakes. If she is not the sort of girl from whom he can obtain gratification for his feelings, it frequently happens that he will go elsewhere to other girls who may be less able to protect themselves. There is a physical danger also to the self-controlled girl who indulges in frequent "spooning." Long-continued "spooning" involves an emotional strain which saps the vitality and weakens the girl both physically and mentally. It sometimes makes her incapable of real affection in marriage.

If girls are to demand clean living from their men friends they must learn to treat them in a frank and friendly way as comrades and to help them maintain high standards instead of trying to win their admiration by purely physical appeals.

### Misuse of Sex

Aside from the lost opportunities for lifelong happiness the misuse of the sex instinct often brings disaster to the health of men and women, and particularly to the children of the future. Sexual intercourse outside of marriage frequently results in the venereal diseases, syphilis and gonorrhea. Any man or woman who has sexual relations outside of marriage may be infected with one or both.

To the individual man a venereal disease may mean lifelong suffering unless by long-continued treatment the germs are destroyed. Syphilis often brings in its train heart disease, paralysis, and insanity. Gonorrhea may cause blindness, incurable affections of the sex organs, and inability to have children.

But this is not all. The innocent may be made to suffer as well as the guilty.

The wife of a man who is infected with one of these diseases often becomes infected. Syphilis may affect her much as it does the man, but gonorrhea often affects her much more seriously. Many surgical operations upon women are made necessary by gonorrhea. Many women are made lifelong invalids or die of it.

A very large proportion of blind babies are made so by gonorrhea in the mother. A great many miscarriages are due to syphilis, and most of the babies born dead have been killed before birth by that disease. Many babies survive, defective for life.

These diseases are contagious. Usually they are passed from person to person through sexual intercourse. Infection may occur from one act only, not necessarily from a series of acts, as some people have believed.

It sometimes happens, too, that a person gets infected through using towels and toilets in public places, or by drinking from a public drinking cup, or from being kissed by a diseased person.

Syphilis and gonorrhea may be cured if recognized in time and treated by a good doctor, but the treatment must be long and regular. The disease often reappears many years after it is apparently cured.

### **The War on Venereal Diseases**

In the recent war, the venereal diseases were a great menace to the fighting strength of our armies. Realizing the danger, the Government did its utmost to protect the men's health, by removing prostitutes (practically all of whom are diseased) from the vicinity of camps, by providing wholesome recreation for the men, and by educating them in regard to venereal diseases.

The result was a tremendous reduction in the prevalence of venereal diseases among the men who went in from civil life to put on the uniform: the number of men contracting a venereal disease after entering the army was only one-fifth as great as the number of those who were so diseased when they first arrived at camp.

Thousands of the young men of the country, through their army training, learned the facts about venereal diseases and rational sex habits. The Government of the United States and the State of North Carolina are seeking to continue this campaign of education and to include both men and women within its scope.

The menace to health from venereal diseases must no longer be ignored or concealed. The effects of these diseases upon men and women and future generations should be known, that all may be on guard to help in the fight against them.

### **Your Duty: To Protect Future Generations**

The duty of every woman and girl, when she has been informed in regard to the relations of sex to life, is to help those weaker than herself to avoid venereal diseases, to demand high standards of conduct from her men associates and to offer to them frank and open comradeship. She must be on guard to protect the health of her children to be—to make the world safe for future generations.

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## **MARRIAGE AND DISEASE**

In Denmark a new marriage law is under consideration. The committee having the draft of the law in charge is unanimous in approving the following provisions:

(1) If the person who wishes to contract a marriage does not suffer, and has never suffered from venereal disease, he shall give a written declaration on his honor to that effect.

(2) In the opposite case, he must either put in a doctor's certificate, made within the previous fortnight, that the danger of infection or its transmission to the children is most improbable; or

(3) If such a declaration cannot be made, he must prove that the other party to the marriage has been informed as to the disease, and that both parties have had oral instruction from a doctor as to the dangers consequent thereon.



## WOMAN'S OPPORTUNITY

The Government is asking of the women and girls of this country that they realize that "sowing wild oats" is not a necessity, that continence makes for health, not against it, and that prostitution shall come to an end.

Women can stop prostitution by taking a definite stand in this matter; and by making a frank explanation of that stand, they can help men to stop demanding it. Women can refuse to associate with men who tend to become familiar—the men will promptly see the point. Girls can insist that the men who offer them marriage shall prove that they are physically fit. Men require that the girls they marry be clean and fit to bear their children. Why should girls be less particular about the fathers of their children? This is the personal stand in the matter. Organized in clubs, in trade unions, in church life—in whatever community groups we belong, we can have a share in directing public opinion on these matters, in the actual efforts being made to close up places of evil resort, to help provide a good time elsewhere for children and grown-ups; for it is useless to say "thou shalt not do this," unless we have something else that is better for them to do. Just as no small part of the marvelous success of the program of self-control and clean living in camps has been because of the splendid recreation facilities offered there, and the wholesome atmosphere created by lead-

ers who are not only good but good for something, so in civilian life tennis and boxing, song, and good books, and interesting things to think about and do will serve a similar high purpose when made part of a community program of clean living.

Never before in the history of any country has there been such an opportunity for social progress, for social justice, for individual ideals as this which faces our country at this time; never before have the women and girls of any country had such an opportunity to make their convictions so felt and their ideals count for so much. It is time for a great "get-together" on this matter of our common welfare. The responsibility is peculiarly upon women in this matter. We are in these days doing the work, carrying some of the responsibilities that men have heretofore shouldered. Shall we shirk the higher responsibility for civic progress and a true democracy which we, no less than they desire—from which we, no less than they, will benefit? Many of us are commanding better salaries now than we had before. This fact has given us a new status in our homes and in our social groups—a status which brings the privilege of decision and the privilege of greater freedom. The powers, the influence that are born of this opportunity—shall they not be devoted to the development of a clean and true democracy?

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## HOW TO TELL THE CHILDREN

With reference to the Venereal Menace Number of the HEALTH BULLETIN one reader writes as follows:

"You ask for an expression of opinion, and here is mine:—great stuff! The only possible improvement that occurs to me is that more stress be laid upon the importance of instructing the kiddies instead of leaving them to the misinstruction of the first embryo sexual pervert who happens to secure them for an audience. It strikes me that it might be well to issue a leaflet of instruction to parents about what to tell them, and I imagine that there are some parents who would find it convenient to have a nice little spiel of this kind already printed which they might memorize and repeat verbatim."

This is a good suggestion. Accordingly there is published this month an article on "Some Information for Mother." Since the best way of telling the children is to answer their questions simply and frankly when their curiosity prompts them to ask questions, it is very difficult to prepare a statement that can be given to them verbatim. In addition to a knowledge of sex matters, parents need a wholesome attitude toward sex in order to properly instruct their children.

## THE PLACE OF THE CHURCH IN THE CONTROL OF VENEREAL DISEASE

By the REV. WORTH M. TIPPY,

*Secretary of the Commission on the Church and Social Service*

We are in the beginning of a great national effort to bring venereal diseases under control, and to finally eradicate them, to eliminate segregated vice districts and prostitution, to provide for the treatment of infected persons, to educate our youth away from the sins which lead to these dread plagues.

The place of the church in this effort is being worked out by representatives of Catholic, Hebrew and Protestant bodies coöperating with the Public Health Service. But we have yet to learn by actual experimentation what to do in detail, except as the churches in certain communities have done valuable pioneer work. For example, in Cleveland, Ohio, the Federation of Churches took the initiative in closing the segregated vice district, working very sensibly and coöperatively with the city administration. It then gave attention to scattered vice and the humane care of such prostitutes as were willing to lead better lives. Within the last two years it started a movement for the treatment of infected persons by the city and hospital clinics. It saw that advertisements against quack medicines and for scientific treatment were put in places where they would be sure to be read. Twelve thousand such cases are passing annually through one hospital alone in that city. This experimentation covers a period of five years, and is exceedingly valuable.

One can see that the church will be most influential in the following particulars:

1. The educational power of the pulpit to break down the conspiracy of silence, to arouse the people to the menace, and to lead them to action. If a pastor hesitates to speak openly from his pulpit, he may address his sex and arrange special meetings for the women of the congregation.
2. The religious education of the Church, including instruction in sex ideals to adolescent boys and girls; the training of young men to become good husbands and fathers, as well as the training of girls to be good wives and mothers; a personal care by pastors, teachers, and leaders of clubs over young people who manifest tendencies to indiscretion, educational work with parents assisting them to train their children.
3. A share in the community effort. A church is a considerable community force, and the pastor is its leader. The churches of a community, if working intelligently together, can do what the Cleveland Federation did. They are in a position to join effectively in agitation for the closing of segregated districts, the humane care of prostitutes, and the treatment of infected persons.
4. The influence of the church will always be strongest in the field of sex morality. Let us hope that the school will give scientific instruction to our youth, and that the church will make this effort practical as well as spiritual and beautiful.

Whenever I think of the church in relation to such a national movement as this I remember that there are in the United States 220,000 churches; 135,000 ministers, priests, and rabbis in charge of congregations; 21,000,000 Sunday-school pupils, 42,000,000 actual members of churches, and several millions of adherents who have been trained in the churches and are in sympathy with their work. The possibilities of this great force, once aroused and acting unitedly, are very large and the coöperation of the church is a civic duty.

## A REASONABLE SEX LIFE FOR A MAN

Many men are frankly and thoroughly ashamed of their sex life as being at once unreasonable and unworthy. Their conduct in other directions is ruled by their judgment, but here they believe themselves helpless in the grip of passion, and they follow with hesitation and shame the customs of the base and the unenlightened. Happily the eyes of young men are now being opened to the stupid cruelty of vicious sexual practices and beliefs.

In the first place, the young man of today is assured on competent scientific authority that prostitution is not a "necessary evil" for men or women. Continence is practicable and healthful; it is proved so by the observation and experience of medical men and physical trainers. A part of the secretions of the sex glands is reabsorbed into the blood, especially during young manhood, with great gain to muscular strength and nervous energy. That which is not needed in the maintenance and development of manly vigor is occasionally discharged at night as a seminal emission.

In the second place, men are becoming more and more indignant over the unfairness of expecting in women a self-control, in matters of sex, which they do not demand in men. Man has made himself the leader in establishing a family, and has thus demanded of himself foresight and chivalry to ward off suffering and wrong from the woman and the children. In the family the heaviest burdens of sex fall upon the woman. Knowing this, a man cannot with decency excuse himself for weakly indulging in vicious practices that violate his own honor as the head of a family and that endanger the health and soil the purity of the woman to whom he gives himself as she gives herself to him.

In the third place, it is more and more seen to be a kind of social crime to go through the forms of respect and courtesy toward women, and then in secret to degrade womanhood in thought and speech and act. Social progress depends upon fuller and franker comradeship and co-

operation between men and women. This is impossible except upon a basis of mutual respect. The very springs of confidence between men and women have been poisoned by those men who have talked vilely about women and acted basely toward them in secret while professing reverence for them in public.

If a man uses his reason on the question of sex, he knows that he must either indulge his sex appetite or control it. For an unmarried man indulgence means self-abuse or prostitution, both of which endanger his health and rob him of self-respect. For a married man free indulgence means depleted energies for himself and his wife, and clouds the happiness of both. The reasonable man finds, therefore, the only way open to him the way of self-control. Thousands of married men have found that continence is practicable for long periods when their wives have been pregnant. Continence is also practicable for unmarried men. If a man sets himself to consider means for the difficult task of self-control, he finds various helps.

The first of these is physical regimen. Wholesome athletic training, as everyone knows, includes sex continence, the eating of plain food, bathing in cool water, followed by vigorous rubbing, sleeping regularly, and taking abundant exercise in the open air. Many a man has mastered powerful sex desires by throwing himself into hard physical work or play, returning to his room healthily tired and dropping promptly into sound sleep.

The second means of self-mastery is mental. More than most other functions of the body, the sex function is immediately and powerfully responsive to the state of the mind, and here especially bodily health depends upon what we might call mental sanitation. This means the ruling out of those interests and amusements in reading and conversation that turn the imagination toward pictures of sex indulgence; it means, also, the pre-occupation of the mind with wholesome thoughts, clean interests, and manly purposes.



# MR. CITIZEN!

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## Face the Following Facts Covering Last Twelve Months in the Old North State!

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Number of Sales of Venereal Disease

Remedies Reported by Druggists . . 16,382

Number of Cases of Venereal Disease

Reported by Doctors . . . . . 8,413

---

What shall we do about it, Mr. Citizen?

In times of war we are willing to dedicate our lives and our fortunes for the protection of our country and our sacred rights.

In times of peace, with knowledge of this great menacing danger, are we brave enough as citizens to fight a winning battle for the protection of our children, our country, and our race?



## HEALTHY WOMANHOOD

Healthy womanhood is the hope of every girl. Every woman who looks forward to motherhood wants healthy, well-formed children.

The United States Government wants every girl and woman to realize these ambitions. The diseases which endanger women and babies more than any others are Venereal Diseases [Gonorrhea and Syphilis].

**Gonorrhea** [sometimes called "clap," etc.] is a dangerous germ disease. It causes chronic ill health, inability to have children, and serious operations on women. Much of the blindness among babies is due to it.

**Syphilis** in many ways is more terrible than tuberculosis [consumption]. Unless properly treated it may lead to insanity, locomotor ataxia and other forms of paralysis. It is responsible for much weak-mindedness and deformity in children. It causes mis-

carriages, still-births, and deaths in infancy.

A girl has the right to demand that the man she marries is free from these diseases. Some men, through illicit sexual relations, become diseased. Unless properly treated they spread infection to innocent girls whom they marry. Quacks or advertising "specialists" do not cure.

**Some Infections Innocent**—Gonorrhea and Syphilis may be *innocently* acquired from public drinking cups, towels, etc. Care should be taken in using public toilets and in handling articles used by infected persons.

Anyone suspecting an infection, *innocent or otherwise*, should see a reputable doctor. "Quacks" and advertising "specialists" should be avoided.

For more information, or information about free treatment, write: Your State Board of Health, or The United States Public Health Service, Washington, D. C., or The American Social Hygiene Association, Inc., 105 West 40th Street, New York, N. Y.

**Infected mothers may bring babies like these into the world!**





# The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

This Bulletin will be sent free to any citizen of the State upon request.

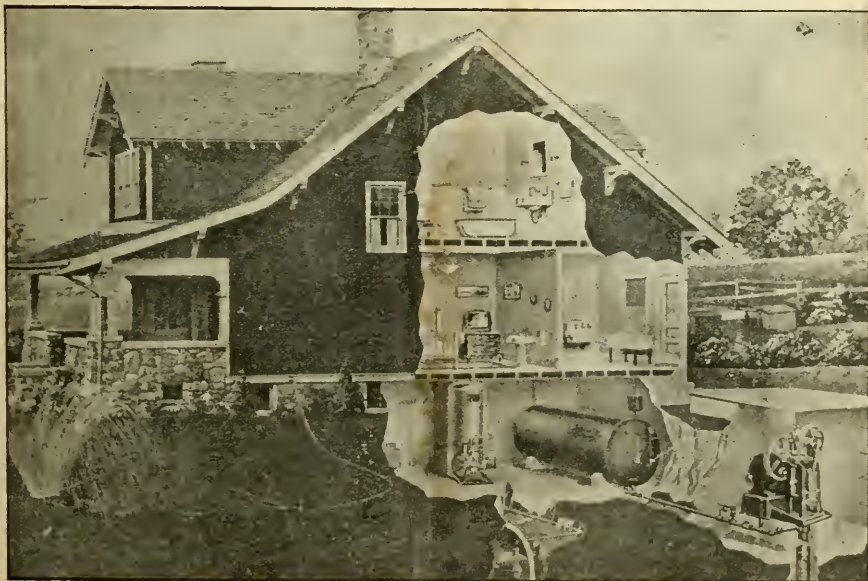
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Vol. XXXV

AUGUST, 1920

No. 8

## WATER SUPPLIES AND PUBLIC HEALTH



SPECIAL WATER SUPPLY NUMBER



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## FREE PUBLIC HEALTH LITERATURE

The State Board of Health has a limited quantity of literature on health subjects for free distribution. If you are interested in one or more of the following subjects, or want same sent to a friend, write to the State Board of Health for free literature on that particular subject.

WHOOPING-COUGH  
 HOOKWORM DISEASE  
 PUBLIC HEALTH LAWS  
 TUBERCULOSIS LAWS  
 TUBERCULOSIS  
 SCARLET FEVER  
 INFANTILE PARALYSIS  
 CARE OF THE BABY  
 FLY PLACARDS  
 TYPHOID PLACARDS  
 TUBERCULOSIS PLACARDS

CLEAN-UP PLACARDS  
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 SANITARY PRIVIES  
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 DISPOSAL PLANTS  
 WATER SUPPLIES  
 EYES  
 FLIES  
 COLDS  
 TEETH  
 CANCER

MALARIA  
 SMALLPOX  
 ADENOIDS  
 MEASLES  
 GERMAN MEASLES  
 TYPHOID FEVER  
 DIPHTHERIA  
 PELLAGRA  
 CONSTIPATION  
 INDIGESTION

## GOOD BOOKS AND PAMPHLETS ON CHILD CARE

### MOTHERS

Why Not Make a Study of Your Profession?

#### *The Mother:*

The Prospective Mother  
 Prenatal Care

#### *The Baby:*

Infant Feeding  
 Care and Feeding of Children  
 Short Talks With Young Mothers  
 Care and Feeding of Infants and Children  
 How to Take Care of the Baby  
 Infant Care

#### *The Child:*

His Nature and Nurture  
 Dietary for Children  
 Food for Young Children  
 School Lunches  
 What to Feed the Children  
 Hygiene of the School Child  
 Child Care

#### *General:*

American Red Cross Text-book  
 Home Hygiene and Care of the Sick  
 Milk, the Indispensable Food for Children  
 Feeding the Family

The Bureau of Public Health Nursing and Infant Hygiene will furnish names of publishers of above upon request.

# THE Health Bulletin



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## WATER SUPPLIES AND PUBLIC HEALTH

### INTRODUCTION

Despite the immense importance of water in human economy and health, very little that has been written on the subject is intelligible to the average citizen. In fact, little effort has been put forth by investigators in this field to reach the mind and understanding of the individual citizen, as the problems involved in obtaining a pure water supply for a municipality, for instance, are such as belong to the engineer and bacteriologist. In a large part, therefore, discussions on the subject of pure water are confined to the realm of scientific literature, which is so technical as to be of service only to scientists. Moreover, endeavors of this nature have been almost wholly centered upon water supplies for large communities, namely, cities and the larger towns; while the individual water supply has received but slight attention. This would be justifiable if we were concerned only with the technical aspects of the subject, as there are few technical features of home water supplies that are not related to established principles in community systems. But it is obvious that for the home water supply, at least, we must translate technical principles into practical terms and methods. This purpose constitutes the principal aim of this BULLETIN.

As regards community or municipal water supplies, we do not propose to unfold all the technical tangles involved therein. However, there are many things about public water supplies that should be known and understood by water customers. Such things as are deemed important in this connection we are attempting to present in such a way as to be of real service to the average reader.

The last two articles in this bulletin are contributed by Mr. H. E. Miller, Chief of the Bureau of Engineering and Inspection; the other articles were prepared by Dr. K. E. Miller, Chief of the Bureau of County Health Work.

### RELATION OF WATER TO HEALTH

By her gentle touch the earth becomes a garden not unlike that in which the first man received the breath of life from the Creator. Her smile inviting man to regions fair has led civilization on and on through every adversity and planted the flag of progress in strongholds but recently occupied by barbarism. By her prodigious power she tears down the mountains and builds verdant valleys; and having established man in the land of plenty she becomes his willing slave, grinding his

corn, driving his engines of labor, and quickening the pulse of commerce which animates the giant world. In perils she is the hope and stay. By the desert traveler, the ship-wrecked sailor, the stricken soldier, and the fevered sufferer she is first to be sought, and to these she is most faithful in her ministrations. In her charms and graces she is irresistible. In her strength and power she is the instrument of God. Who and what is this gentle and yet all-powerful friend of man and his fellow-creatures? In our language she goes by the humble name of WATER.

But we cannot go farther into the speculation of the manifold services rendered by this great friend of man. We must here limit ourselves to water in its direct relation to human health. Water is not only the friend of man, but in a material way we may almost say that water and the human body are one and the same thing, as water constitutes about 75 per cent of man's body weight. The importance of water in the economy and welfare of the human body, therefore, can hardly be exaggerated.

### EXTERNAL USES

1. **A Cleansing Agent.**—Water has at all times been recognized as a cleansing agent of universal application. Its external uses, therefore, have a well deserved place in our daily customs. The skin must be regarded as an organ for throwing off body wastes and impurities just as the kidney and certain other internal organs. Such waste products accumulate upon the skin, and, along with dust and dirt from other sources, must be removed by washing if the skin is to remain healthy and capable of ridding the body of injurious substances. Unless this is done the pores of the skin get plugged up with dirt, and frequently become in-

fectured, giving rise to pimples, boils, and carbuncles.

2. **Tonic and Sedative.**—For external purposes, also, water has another and perhaps more important value. By the application of water in tub, shower, or sponge bath most remarkable effects upon the body may be obtained. In general, cold baths are stimulating and invigorating; warm or hot baths are sedative and enervating. For instance, when one feels tired, sleepy, or "lazy" a cold bath with a brisk rub-down will revive the energy and flagging spirits. Thus we have a ready means of positive demonstration with reference to the effects of the cold bath. But many of its effects, though most important, are less obvious. In any case, the underlying principle is a general stimulation of the entire nerve system of the skin. The vast flow of impulses from the skin to the brain arouses the sleeping nerve cells all along the line so that the nerves are quickened, the muscles tightened, and the entire body placed upon the alert. The process therefore is in reality a general tonic to all body tissues. The tonic effects of the cold bath, in fact, are superior to those derived from drugs and medicines. A daily practice of cold bathing, preferably before breakfast, will not only render a person keen and fit for the ensuing day's work, but will fortify the body against infectious diseases and unsound mental states, which might overtake and subdue a mind or body less fitted for such emergencies.

The benefits derived from warm baths are just the opposite of those described for cold baths. Warm water on the skin has a depressing rather than stimulating effect upon the nerves and a corresponding influence is exercised upon the entire nervous system. When a person is worried, agitated, or fatigued and



desires rest, a hot bath before going to bed will bring on complete relaxation and peaceful sleep, which is nature's own remedy in the healing of human ills. In the treatment of certain nervous conditions such as convulsions or spasms, for instance, a continuous warm bath will bring prompt relief except in the severest cases, in which also it is a valuable assistance.

**3. Fever Reducer.**—As a means of reducing temperature in cases of fever the use of water externally as well as internally stands preeminent. The method ordinarily employed for this purpose is the sponge bath. It makes little difference as to the exact temperature of the water, but tepid or lukewarm water is most satisfactory as a rule. Through the application of water to the skin a certain amount of heat is directly absorbed by water which is slightly below the body temperature. Perhaps the greater effect in heat reduction is accomplished through evaporation of the film of water from the body surface, as evaporation is a tremendous factor in heat absorption. It is likely also that the brain centers are favorably influenced by a bath of this kind, as the heat reduction is usually more or less lasting, and restful sleep may ordinarily be expected.

**4. Mineral and Salt Baths.**—Many watering places that have become famous on account of their baths owe their popularity to the mineral or salt contents of the water. Such minerals or salts doubtless do have some beneficial effects, but perhaps a good portion of the virtues claimed for them is derived from temperature reactions as described above.

### INTERNAL USES

**1. Necessary to Life.**—For external purposes, as we have just seen, water performs many helpful serv-

ices, but for internal use it is an absolute necessity. The body is indeed a vast chemical laboratory in which nature compounds the little cells which are properly grouped and joined together into the most perfect work of creation, the human body. Without water, however, no chemical action takes place, and hence no growth or development, or even life. Under normal circumstances the body demands about three quarts of water per day, but unfortunately the amount of water consumed is likely to be below the normal demand.

**2. Internal Cleansing.**—In addition to the internal demands for water as a basis of chemical growth and development we find it quite as necessary as an agent for internal cleansing. In the process of cell change and energy production a great amount of waste material accumulates in the tissues. Several avenues are provided for the escape of detrimental and poisonous body wastes, but in each instance these waste matters are dissolved and carted off to the rubbish heap by means of water. An excellent illustration of the foregoing principles is furnished by cases in which, for some reason, the secretion of urine is stopped. A serious condition known as uremia ensues, and death takes place in from 24 to 48 hours thereafter.

**3. Mineral Waters.**—Under this term are ordinarily included such waters as contain chemical substances in sufficient amount to impart a definite taste to the water. The taste is usually rather unpleasant, but this very fact is responsible in large part for the profound impression made upon the popular mind relative to supposed medicinal virtues possessed by such waters. Mineral substances most commonly found in waters of this nature are various compounds of iron, sulphur,

soda, lithia, arsenic, lime, and magnesia. It is true that waters charged with these several minerals will produce certain effects in the human body when taken in sufficient quantity and over long enough period of time. The common properties which are known to be possessed by different members of this group are: (1) laxative; (2) astringent or constipating; (3) bitter, and hence employed for tonic effects; (4) alkaline, and therefore useful in cases of acid or sour stomach. Many other claims are made which cannot be positively substantiated. The primary benefits gained from mineral waters, however, are doubtless due to the quantity rather than the quality of water consumed. Along with this must be considered the fact that persons who visit watering places give themselves over to a period of rest, amusement, and freedom from worry. Of late years there has been an effort to attribute beneficial effects to certain famous mineral wells and springs on the ground that small traces of radium and uranium could be demonstrated in their waters. It must be admitted that this makes good advertising material, but whether it amounts to anything further is yet to be confirmed.

**4. Hard Water.**—On the other hand, waters which contain compounds of lime and magnesia are popularly credited with harmful rather than helpful effects, on account of hardness which characterizes water in which compounds of lime and magnesia are dissolved. Numerous efforts have been made to establish a relation between hard water and gall stones, kidney stones, and bladder stones. Also, there is a common belief among people affected with any kind of kidney disease that hard water aggravates, if not actually causes, such conditions.

Science, however, has failed to discover any positive evidence to support these views.

**5. Germ Pollution of Water.**—Thus far the discussion of water in its relation to health has not taken into account the bacteriological impurities found in water. A rather large variety of bacteria or germs may be found in drinking water, some of which are harmless, while others are disease producers. It is, of course, highly desirable for drinking water to be free from all germ life, though this is in some instances either impracticable or impossible. In any case, however, we must insist on taking no chances with germs which are capable of causing human sickness. The question at once arises as to how one is to tell the difference between harmless and harmful germs. By laboratory examination this is comparatively easy. But this method is not at all practicable for general use, except in the control of supplies for towns and cities having waterworks. A little simple reasoning will disclose the means by which we are able to detect the presence of danger from disease-producing germs. The germs which are capable of causing disease through contamination of drinking water of man are invariably derived from human sources. The sources most prominent in this connection are the urinary and fecal discharges, which are commonly mingled with the surface filth about the premises. Any water supply, therefore, which will permit of contamination with surface filth in any way whatsoever stands condemned without further evidence. Laboratory examination may be employed also, as an additional check, but if it fails to show pollution the report means nothing, as such water supplies are at all times potential if not actual reser-

voirs of disease. As we shall see in another article, however, even such water supplies as show constant pollution can be rendered safe for drinking purposes by means of suitable methods for destroying the germ life.

### WATER-BORNE DISEASES.

1. **General.**—The diseases which are spoken of as water-borne infections are also, in a broader sense, called filth borne, which is explained by the fact that water is simply one of the mediums through which disease-laden filth is carried into the human body. The principal representatives of this group are typhoid fever, various types of dysenteries and diarrheas, and several varieties of intestinal worm infections.

Since typhoid fever is the best known representative of the group, and since the other members in their origin and control are closely parallel to typhoid, the latter disease is always taken as the example. In order to observe the effects of water pollution upon sickness and death rates we are forced to resort to evidence from cities where accurate records have been kept with reference to all the factors bearing upon the question. There are numerous instances of striking epidemics of typhoid fever and cholera arising through pollution of water supplies. The following account of such an epidemic in Plymouth, Penn., is typical and is here given for illustration:

2. **Typhoid Epidemic in Plymouth, Penn.**—"In 1885 the mining town of Plymouth, Penn., with a population of about 8,000, suffered with a severe outbreak of typhoid fever which involved one in every eight of the inhabitants. Plymouth received its water from a mountain brook which drained an almost uninhabited watershed. The stream was dammed at intervals and the water was stored in

a series of four small impounding reservoirs. The source of the infection was traced to a citizen who spent his Christmas holidays in Philadelphia and returned home in January. He contracted typhoid; the excreta were not disinfected, but were thrown either into the frozen creek or upon its banks within 25 or 30 feet of the edge of the stream. At this time the brook was frozen and

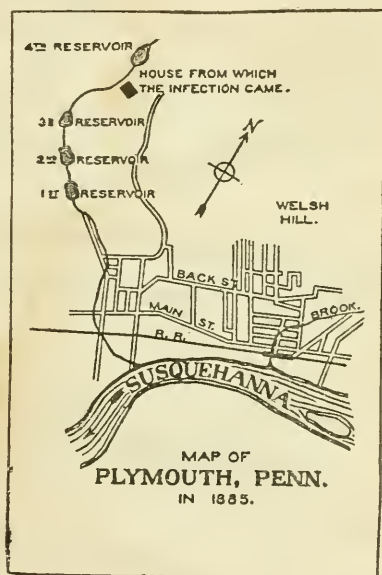


FIG. 1.

remained so until spring. There came a thaw in March and the entire accumulation was washed into the brook and thence into the water-main. Three weeks thereafter cases of typhoid by the score made their appearance throughout the town. On some days more than 100 new cases occurred. In all, 1,004 cases were reported. Some estimates placed the number at 1,500, that is, 1 in every 5 of the inhabitants. There were 114 deaths. The epidemic was limited to the houses supplied with the town water or to persons who drank of the public water supply. The dis-



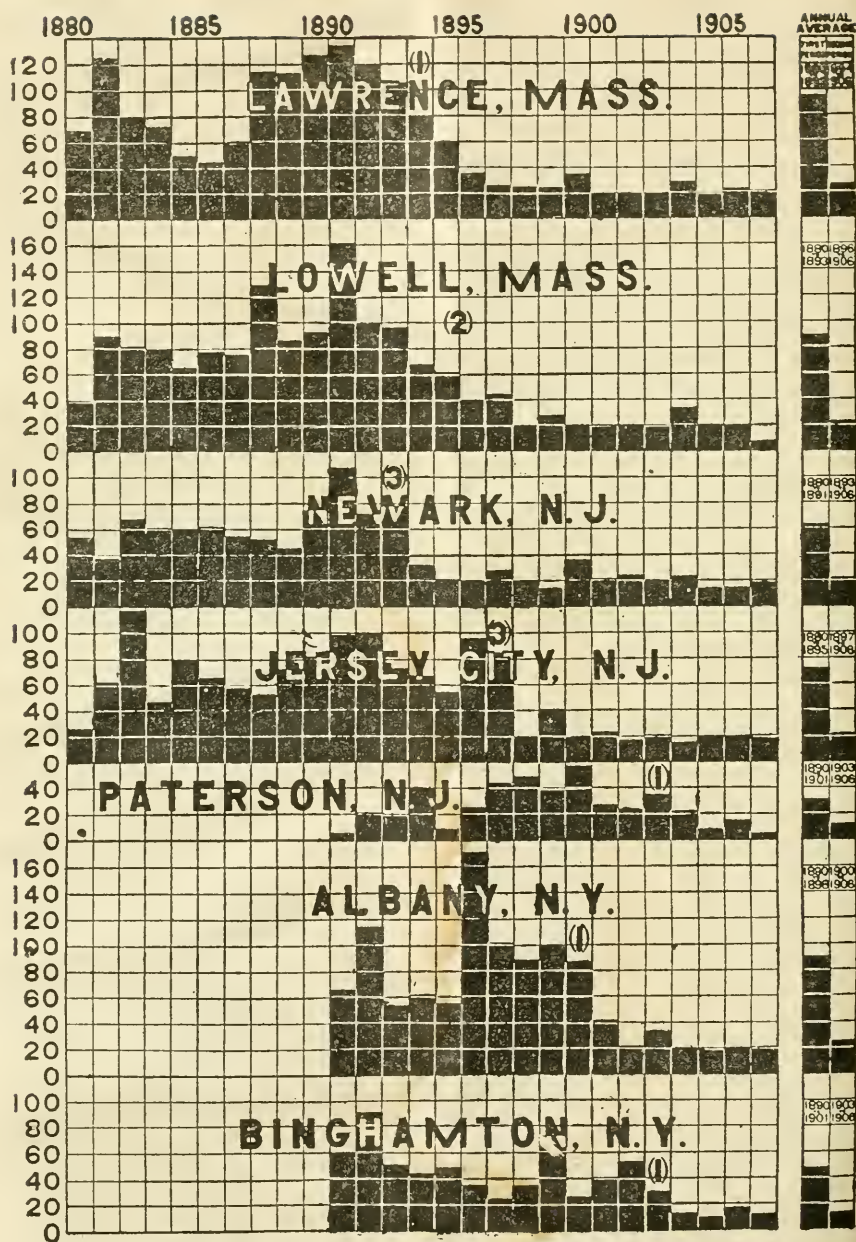
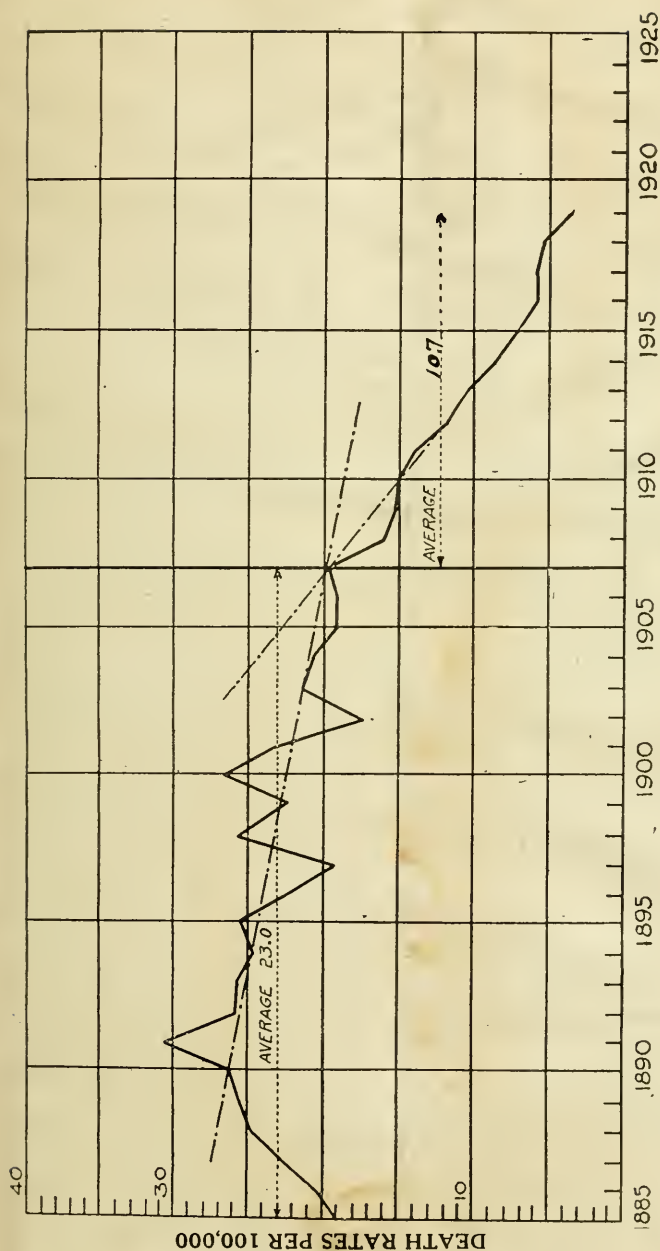


FIG. 2. Effect of water purification in six different cities.



# TYPHOID FEVER DEATH RATES IN NEW YORK STATE SINCE 1885

NEW YORK STATE DEPARTMENT OF HEALTH

*Theodore H. S. Taylor*  
CHIEF ENGINEER

FIG. 3.

tion was particularly emphasized on one street where the houses on one side had one or more cases while the houses on the other side had none at all. The former were supplied by the town water, the latter depended upon wells.

This epidemic will ever stand out in the literature as a clear-cut instance of water-borne typhoid caused by the quick transfer of virulent material from a single case. It proves further that freezing alone was not sufficient to destroy the typhoid infection, and on account of the coldness of the water it is exceedingly unlikely that any multiplication of the typhoid bacilli occurred. The infection, although greatly diluted, was nevertheless sufficiently virulent to induce the disease in most of those who drank the water. It further teaches the lesson how one person is sufficient to defile the "pure waters of a mountain brook draining an almost uninhabited territory." This epidemic was the first large outbreak in America where the cause was definitely traced to the water supply. It stands out sharply in the sanitary annals of our country on account of the lesson it taught and the good influence it had in stimulating other cities to safeguard and improve their water supplies."\*

### 3. Effects of Water Purification.—

Instances like the foregoing are, of course, immensely interesting though rather unusual. A better picture of every-day conditions is furnished by figures Nos. 2 and 3. In figure No. 2 the following features are noted: Six cities in three different States show a yearly typhoid death rate over a period of 25 years, of 69.4 per 100,000. In every instance the adoption of improved methods for water purification resulted in a

prompt and permanent drop in the typhoid death rate. The death rate following the use of purification in these cities has struck a yearly average of 19.8 per hundred thousand, which is a reduction of 70.5 per cent.

More striking still is the story told by figure No. 3. This is a diagram representing the combined average yearly death rates for 57 cities in New York State from 1885 to 1919, whose combined population in 1918 was 8,234,736. From 1885 to 1907 there is a gradual decline of the death rate coincident with a gradual improvement of the public water supplies. In 1907 the New York State Board of Health began active measures for the improvement of public water supplies with the wonderful result shown in the chart. Since 1907 there has been a steep decline of the typhoid death rate from 20 per 100,000 in 1907 to 3.3 in 1919, a reduction of 83.5 per cent. It is specifically stated in this connection by officials of the New York State Board of Health that typhoid vaccination and other typhoid control measures have been employed to such a small extent as to be almost negligible in their contribution toward this result.

We must be guarded against drawing too close a parallel between the results shown above and what may be expected from similar methods in North Carolina for the reasons (1) that the insanitary privy and associated fly contamination of foods plays a much more important part in the spread of typhoid fever in our State than it does in New York; and (2) that North Carolina is essentially rural with individual water supplies and individual privies, whereas the above statistics are derived entirely from cities where public water and sewerage systems are employed. Taking these things into account, however, the evidence to establish

\*Rosenau, "Hygiene and Preventive Medicine."



the direct relation between drinking water supplies and human health is overwhelmingly convincing.

**4. Parasitic Diseases.**—In addition to the bacterial or germ diseases resulting from impure water supplies, certain parasitic infections deserve mention. The ordinary round worm or "stomach" worm, the hookworm, whip worm, dwarf tape worm, and the parasite causing amoebic dysentery, are not uncommonly transmitted through drinking water in North Carolina. These parasites live in the human intestines, and their eggs and spores are accordingly mingled with the bowel discharges. After leaving the body they gain access to drinking water supplies in the same manner as described for typhoid and other germs.

**5. Erroneous Conclusions.**—We so frequently hear intelligent people drawing erroneous conclusions with relation to the effect of water on health that a word on this subject is here in order. Stagnant pools covered with green scum are favorite objects of criticism, particularly if there happens to be a foul odor arising therefrom. The prevailing idea is that the odors or vapors from such sources are capable of producing typhoid fever or malaria, or both. As regards typhoid, no such thing is possible unless the water should be drunk or gain access to the intestines along with the food. With respect to malaria, however, there is ground for apprehension. Stagnant water is likely to be a prolific breeding place for malaria-carrying mosquitoes which may feed upon a person affected with this disease and thereafter may carry the disease to a healthy person. But neither odors nor vapors have any part whatever in the causation of chills and fever or any other kind of sickness.

### MARVELOUS EFFECTS OF WATER PURIFICATION ON GENERAL DEATH RATE

It is quite in accord with fact to say that the benefits of water purification are beyond comprehension. There are certain specific diseases which have been mentioned previously in this discussion, and which are definitely known to be transmitted through polluted drinking water. We can therefore count on great reduction of death rates from such diseases by purification of the polluted water supply. But water purification has been repeatedly found to reduce the general death rate far in excess of the amount that could have been expected from reduction of specific water-born diseases. This phenomenon was first noted by Mr. Hiram F. Mills of Massachusetts in 1893 following the introduction of water filtration in the city of Lawrence, Mass. In the same year the water supply of Hamburg, Germany, was subjected to filtration, and the same phenomenon was noted by Dr. J. R. Reincke, health officer of the city of Hamburg. Since that time this matter has been extensively studied and closely observed, and experience has rather consistently demonstrated that the facts above noted are something more than mere accident. For every life saved from typhoid fever in Lawrence, Mass., there were 4.4 from other causes; in Hamburg 16 deaths from general causes were avoided for every typhoid death prevented; at Lowell, Mass., it was 6 to 1; at Albany, N. Y., 4 to 1; at Binghamton, N. Y., 1.5 to 1. By virtue of this wonderful observation known as the Mills-Reincke phenomenon, an eminent authority has stated that wherever one death from typhoid fever has been avoided by the use of better water, a certain number of deaths,

probably two or three, from other causes have been avoided. Pure water, therefore, carries with it a multitude of blessings which we cannot even understand. Whether it be the humble farmhouse well or a great city water system it is all the same. Any compromise on the purity of drinking water is not only inviting the dangers that are well known, but, also, as 'seen above, even greater dangers that yet remain unknown.

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## SOURCES OF WATER SUPPLY FOR FARM AND VILLAGE HOMES

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**Standards of Purity.**—The first point to be determined in the selection of a source of drinking water supply is its purity or freedom from contamination with dangerous dirt. Unfortunately, however, other considerations are frequently given first place. The average farmer is quite satisfied if his well affords clear and cold water. While these characteristics are to be sought for, they are by no means reliable indicators of the purity of drinking water. In fact, one of the worst contaminated and most dangerous drinking water supplies the writer has ever seen was a beautiful bubbling spring that flowed from a crevice in a limestone cliff. Its water was as clear as crystal, and icy cold all during the summer months. It was the source from which was derived the drinking water supply of a large consolidated country school, and was, in fact, the pride of the whole community. Investigation traced a considerable number of cases of typhoid fever to this spring each year and laboratory examination showed the water to be grossly polluted. Laboratory examination, however, should have been unnecessary, as there were five open

surface privies surmounting the crest of the bluff about a hundred feet above the spring.

**Protection Against "Dangerous Dirt."**—The purity of a drinking water supply is governed by two simple requirements: (1) Protection against access of surface drainage and surface contamination of all kinds. (2) Protection against access of dangerous dirt through underground channels. The importance of these two factors is in the order given, though the tendency of the average mind is to put underground contamination first. It would be improper to say that no such contamination occurs. This is particularly true of limestone regions where the rock layers come close to the surface and are cracked and fissured. The seepage from privy vaults, cesspools, and the like travels along the surface of such rock layers and through the cracks and crevices so that wells are sometimes so located as to tap underground sewage channels. There is; for instance, a certain town in Kentucky whose entire sewer system is discharged into a hole in the ground communicating with unknown caverns underneath the town. Similar dangers may be encountered in very low regions where the ground water comes close to the surface. Other means of underground contamination are frequently cited, such as drainage through tubes produced by the burrowings of crayfish and certain beetles, channels formed by the rotting of tree roots reaching the well, and by natural seepage through the compact soil. These dangers, however, are considered to be very much overrated, and all of them may be avoided by allowing no privy filth to be deposited on or in the ground within 200 feet of the well.

**Surface Drainage Pollution.**—By all means the more essential factor

in obtaining a pure water supply is the exclusion of all filth which might gain entrance direct, rather than through subterranean channels. To guard against this method of contamination one must take care (1) to locate the well on ground up grade from the privy, pig pens, and barn yard, and (2) to use especial diligence in providing a water-tight well top, and water-tight curbing extending down around the top of the well to a depth of two feet or more. For this purpose there is no material so

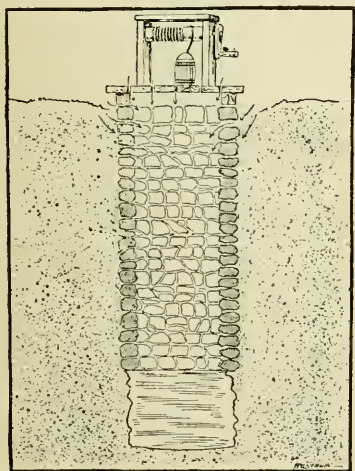


FIG. 4. Dug well showing openings through which surface pollution commonly enters.

good as concrete. What is said about protection of well tops, of course, applies with equal force to cisterns and springs, and indeed no source of drinking water supply can be considered safe until adequate protection against surface filth is provided. Samples of water from open well, open springs, and open cisterns are frequently sent in to the laboratory for examination. Examination of such samples is worse than useless. If the sample happens to show no contamination at the moment, the owner of the well falsely believes in the safety of his drinking water. On the

contrary it must be emphasized that any water supply that may allow surface filth to enter in any way is potentially dangerous and should not be tolerated.

Some of the familiar conditions contributing to this danger are the following: (1) Loose curbing allowing surface water to run in; (2) leaky well platforms, permitting human and barnyard filth to be carried thither by the feet of human beings and domestic animals, to be shattered through the cracks or washed into the well by rains and splashing; (3) well ropes dangled in the dirt and trampled upon, the accumulated dirt then becoming shattered off into the well when the rope descends; (4) handling of well bucket by hands soiled with all manner of filth.

**Types of Impurities.**—A great variety of impurities may be found in drinking water supplies rendering the water unfit for use, but they are not all of equal significance. The commoner ones are ordinary surface trash, stable manure, chicken droppings, wiggletails, fish worms, "red" worms, dead animals, and privy filth. Any of these would give rise to germ contamination, which would appear in laboratory examination, but sickness and disease spring, as a rule, only from human filth. Thus is explained the meaning of the term "dangerous dirt" as used above. In fact, from a health standpoint, dirt may be divided into three classes (1) clean dirt, or that containing neither animal nor vegetable matter; (2) dirty dirt, comprising all kinds of animal and vegetable filth, and (3) dangerous dirt, or that type of dirty dirt that contains elements that would create human sickness or disease.

The purity of drinking water has a very vital bearing upon health. The installation of a pure water supply



affecting any community never fails to result in a decided improvement in general health conditions, which, as we have seen in the foregoing article, is sometimes most astonishing. The specific diseases involved in this reduction, as we have also seen, are typhoid fever, diarrheal diseases of both children and adults, hookworm disease, round or "stomach" worms, and other worm infections of the intestines. An open well, cistern, or spring is likely to be laden with any or all of these infections, due to the fact that human waste matter containing the germs of these diseases may easily get into any open water supply. Closed wells, more especially driven and drilled, practically eliminate these dangers.

### WELLS

Wells may be classified for different purposes as (a) shallow and deep; and (b) dug, bored, driven, and drilled.

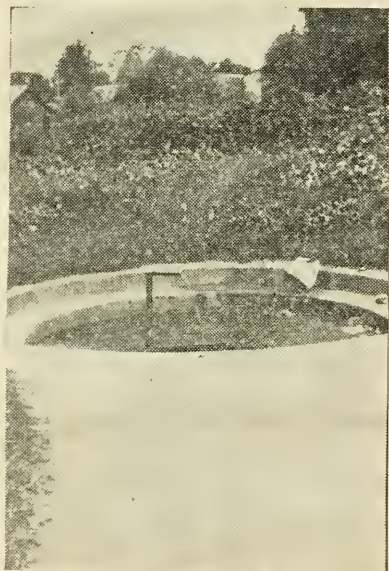


FIG. 5. Artesian or flowing well. One type of drilled well.

**Shallow and Deep.**—The terms shallow and deep are not determined wholly by measurement in feet, but indicate particularly whether the water is drawn from above or below the first impervious layer, such as unbroken rock or water-tight clay. It is clear that deep wells are much less liable to contaminating influences than are surface or shallow wells, and are consequently worthy of the highest recommendation. As a rule, however, deep wells are more expensive to construct, due to the fact that they ordinarily reach a depth of 100 feet or more, and are usually drilled, involving the use of rather expensive machinery. Their superiority, however, over surface wells is so great as easily to justify a considerable difference in expense. In some localities it is possible to obtain artesian or flowing wells by going down to a depth of 300 feet or more. No better water supply can be procured than the artesian well, as it is proof against surface pollution and practically so against underground contamination. In addition, it is freely flowing, obviating the need of a pump and labor to operate it.

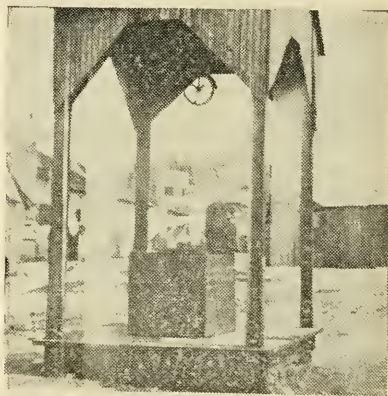


FIG. 6. Improperly protected dug well. Notice bricks missing from the curbing. Cracks in platform afford ample opportunity for surface pollution to enter as illustrated in Fig. 4.

**Dug Wells.**—From the standpoint of construction, wells are either dug, bored, driven, or drilled. In addition to the previously mentioned specifications for securing a good water supply, no well should be considered satisfactory that is not provided with a water-tight casing or wall down as far as the water-bearing layer, in shallow wells, and to the impervious rock or clay in deep wells.

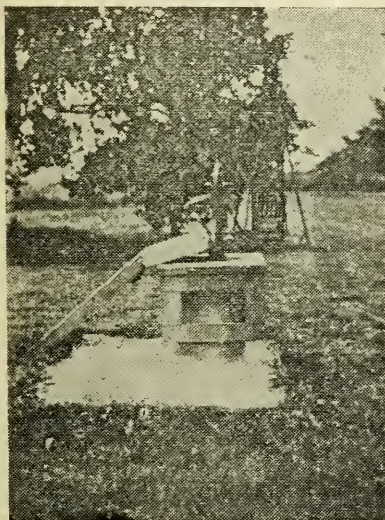


FIG. 7. Dug well properly protected. Notice pump and terra-cotta curbing surrounded by base of concrete.

As will be recognized, dug wells by their very nature violate certain of the rules for a safe water supply, and they are ill-adapted to being rendered even reasonably satisfactory. The instances are certainly few where some other source of drinking water would not be better.

**Bored Wells.**—Bored wells are not commonly seen in the Southern States, but when provided with terra cotta casing having water-tight joints, the bored well may be a very considerable improvement over the dug

well. Another important feature of this superiority lies in the fact that pumps are usually used instead of bucket and rope. The "old oaken bucket" occupies a very enviable po-

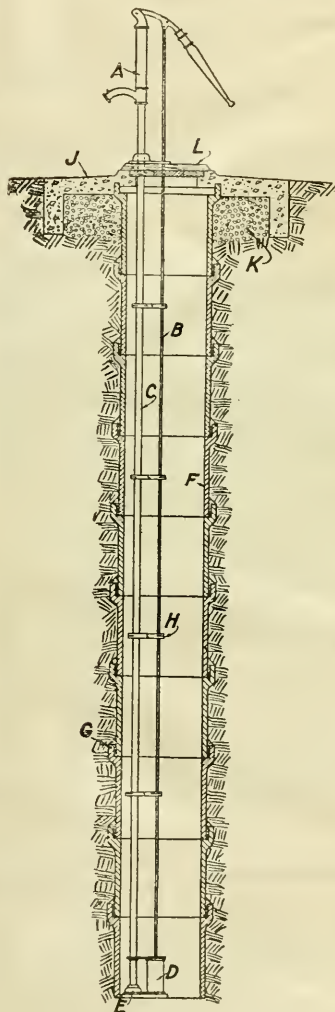


Fig. 8. Section of a dug well with pump showing proper type of casing and protection about the top. Curbed with vitrified socket pipe. (a) Pump stand; (b) pump rod; (c) riser pipe; (d) cylinder; (e) check valve; (f) vitrified socket pipe; (g) joints packed with a strand of oakum dipped in grout and filled with cement mortar; (h) pump rod guides; (j) platform; (k) gravel foundation; (l) cross-planked cover.



sition in sentiment and song, but that is the extent of its rightful service. It should never be used as a means of drawing drinking water where it is possible to provide a pump.

**Driven and Drilled Wells.**—The driven well is coming into ever increasing popularity of which it is well deserving. Unfortunately it cannot be obtained in all localities. As the term indicates, the pump point is driven into the earth with a sledge or some other driving instrument. If rock or any other resistant sub-



FIG. 9. Driven well with excellent protection about the top afforded by gettered block of concrete surrounding pipe.

stance is encountered the effort has to be abandoned. The driven well, like the drilled well, must necessarily be operated by a pump, being entirely enclosed, and therefore most admirably fortified against surface contamination entering from the top. In the category of shallow wells the driven well, except in rare instances, is without an equal.

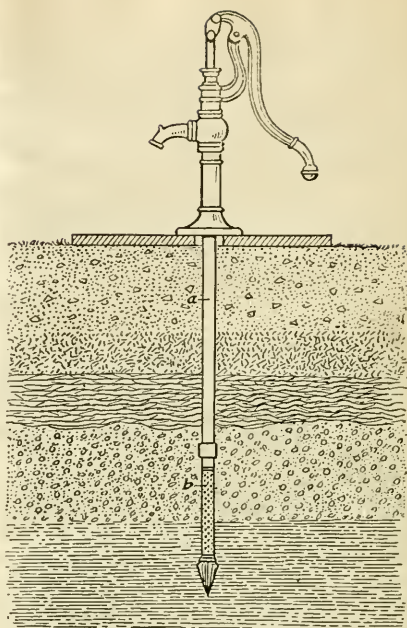


FIG. 10. Section of driven well showing pipe. (a) Piercing several earth layers, and pump point; (b) located in water-bearing gravel.

**Cisterns.**—Cisterns are used for the collection and storage of rain water. In some localities it is necessary to use cisterns on account of inability to derive a sufficient or satisfactory supply of water from the earth. They must not only be capable of holding water over a long period of time, but they must also exclude seepage of water through the walls from without. Not infrequently a person complains about the water in his cistern becoming hard. This condition always means leaky cistern walls. The discussion with reference to protection of wells against pollution from surface filth applies in like manner to cisterns. The water in cisterns commonly has a brownish tint and a characteristic taste, due in the first place to taking into solution certain substances found in



cedar shingles, particles of soot and dust found on roofs, and the juices of leaves so commonly found clogging the eaves troughs. In addition to these things, the taste is to a certain extent dependent upon the absorption of gaseous substances by the rain drops as they form and travel through the air. Filters are frequently used to aid in the removal of both coloring substances and the peculiar taste. Among other things found in cistern water are small amounts of certain organic substances, which furnish excellent food for mosquito breeding. Therefore, particular care has to be exercised to exclude mosquitoes from the cistern. The water not only becomes infected with "wiggle-tails," but one has at his door a perfect reservoir of biting and perhaps malaria bearing mosquitoes. In searching for the source of mosquitoes, therefore, never fail to examine the cistern for "wiggle-tails."

**Springs.**—Springs are ordinarily held in very high regard as sources of pure drinking water. In fact the tendency is too much in this direction, according them an unquestioned acceptance, without regard to their

origin or the conditions surrounding them. The spring differs essentially from the other sources of water supply here discussed in that its location is fixed by nature. This location, also, is least to be desired, being always at the bottom of a hill and consequently in a position to receive the drainage from the hillside. Frequently, also, the spring crops out at or near the margin of a small stream, subjecting it to the danger of overflow from the stream in times of flooding. Since these things are so, especial care must be taken to shed away all surface water. For this purpose it is necessary in all instances to supply the spring with a water-tight curbing to a height of at least two feet, the water running in at the bottom and out at the top. In addition, an appropriate cover should be provided for the spring, so as to keep out domestic and other animals, leaves, and other trash. Being unable to exercise choice in the location of a spring, one has to choose its surroundings instead. That is, no human habitation should be allowed on the area sloping directly toward the spring, and, so far as possible, animals also should be excluded.

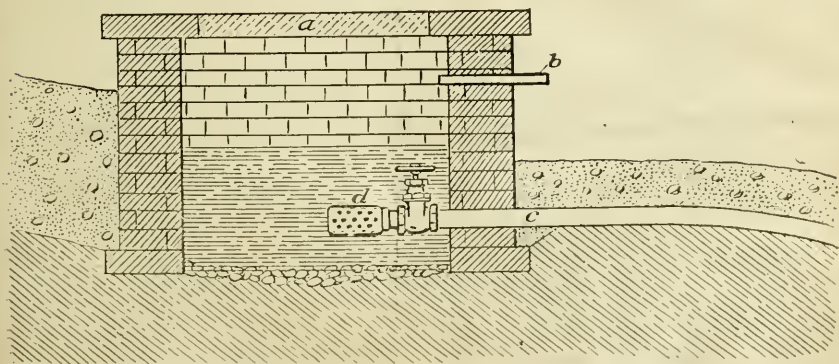


FIG. 11. Properly protected spring with top entirely covered with concrete slab, A; overflow pipe, B; drain pipe, C, to be used when water is to be piped to a distant point; and strainer, D.

## PRACTICAL METHODS FOR REMOVING IMPURITIES FROM PRIVATE WATER SUPPLIES

**Hardness.**—For drinking purposes hardness should not be a matter of particular concern. But for economic reasons the removal of hardness has a certain amount of importance. When soap is used in hard water it forms a curd until enough is used to overcome the hardness. In water that is even moderately hard at least

one pound of soap to every 75 gallons of water is wasted in this way. A certain portion of ordinary hardness may be removed by boiling for fifteen to twenty minutes. The portion which is not thrown out in this way may be removed advantageously by use of washing soda or lye in connection with the boiling. The substances causing hardness separate out and rise in the form of a white scum, which may be removed and thrown away.

**Tastes, odors, coloring matters.**—Cistern water is commonly subject to one or more of these objectionable

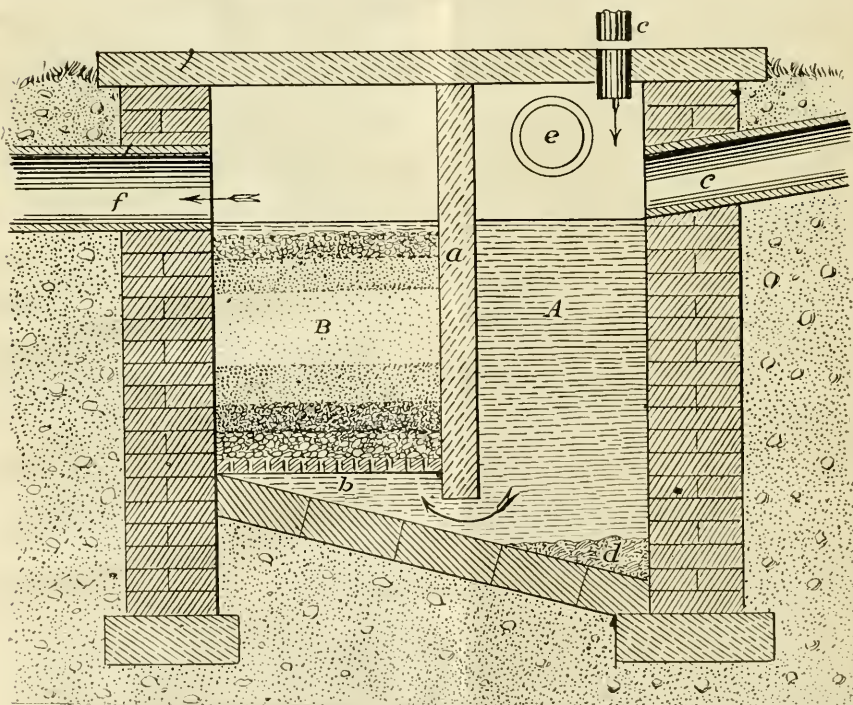


FIG. 12. Cistern filter. The body of the filter is built of brick, laid in mortar composed of Portland cement mixed with an equal volume of clean sharp sand, and it is divided into two chambers by means of a partition slab (a) of concrete or flagstone. The bottom of the chamber, A, is provided with a low place or pocket (d) in which sediment may gather, and from which it may be removed by the garden pump or other convenient means. The chamber, B, is fitted with a perforated bottom (b), on which is placed a course of gravel, and then clean sand, nearly up to the level of the discharge pipe (f). It is topped with gravel. The rain water enters the chamber, A, through the pipes (c), and deposits any solids that may accompany it in the pocket, as shown at (d). It then flows upwards through the sand in the chamber B, which clarifies it. The chamber, A, is also provided with an overflow pipe (e), so that if the filter becomes choked with dirt the water will not acquire sufficient head to force the dirt through the filter; it also acts as an overflow for the cistern into which (f) delivers.

qualities. The difficulties may be overcome in large measure by use of a filter constructed as shown in cut No. 12.

**Germ Pollution.**—For immediate removal of bacteria from water the simplest and most certain method is boiling for five minutes. This method of course is applicable only to a small amount of water at a time, and does not in any way affect the well or spring from which the polluted water is derived. Fortunately, polluted water supplies are practically always open reservoirs, and therefore easily accessible. The cheap and efficient treatment for such water supplies is chloride of lime, more commonly known as bleaching powder. The powder must be thoroughly mixed with water, one pound to the gallon, before introducing into the well. Special stress should be placed on the freshness of the powder, since it rapidly loses its strength if exposed to the air for a short time. The best rule is to keep up the dosage until the water tastes and smells strongly of chlorine. The water may then be drawn from the well until the chlorine is no longer objectionable.

**"Wiggletails."**—When mosquitoes have access to open water supplies they are likely to deposit their eggs therein. In a few days the eggs hatch into wiggletails, which eventually become mosquitoes if allowed to develop undisturbed. The thing of first importance is to exclude mosquitoes from the well, spring, or cistern. Once the water becomes infested with wiggletails, however, they may be readily destroyed by pouring a half pint of kerosene upon the surface of the water. This need not necessarily render the water unfit for drinking as it is possible to draw water either by bucket or pump with-

out particular annoyance from the film of kerosene. In any case, however, the kerosene will evaporate from the surface in about a week or ten days so that the objectionable features of this procedure are short lived. Another simple expedient is the use of a pump point carrying a fine sand-screen, as the "wiggletails" cannot pass through the screen.

**"Red Worms" and Angle Worms.** These are almost certainly evidence of a dug well with totally inadequate curbing and walls. Whenever found, the well should be thoroughly cleaned out and the walls, curbing, and platform subjected to complete overhauling. In particular, the curbing must be rendered water-tight for a depth of two and one-half feet below the surface, and preferably continuous with a water-tight wall as far down as the water-bearing stratum.

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## WATERWORKS FOR THE PRIVATE HOME

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The place occupied by the private water system is midway between the ordinary farm well and public waterworks. Below the ground it is indeed identical with the former, while above the ground the general principles of the latter are employed. It is the nearest approach to a public system, that is obtainable on the farm, and represents the ideal toward which every farm home should strive.

The following are the essential features of a system of this kind: (1) an abundant water supply; (2) a special pump; (3) a power pumping arrangement; (4) a water storage tank to distribute the water to all parts of the house under pressure; (5) a system of piping, spiggots, and drains to carry the water from the well to the tank and thence about the



house, and finally to carry off the overflow and waste. It is obvious from the foregoing that the construction of a private water system is rather beyond the ability of the average individual, and for this reason no attempt is here made to give exact specifications.

**The Water Supply.**—This is ordinarily a well, which should conform to the requirements for a safe water supply as described in a previous article. Occasionally a spring may be utilized for this purpose.

**The Pump.**—An ordinary lift pump will not suffice. A force pump of some type is required. In some instances where springs are used a hydraulic ram may be made to force the water into the storage tank.

**The Power Pumping Device.**—Windmills are frequently employed to a good advantage for this purpose. In recent years, however, the gasoline engine and pump-jack have come into very general use.

**The Storage and Pressure Tank.**—The common practice is to elevate the storage tank above the highest point of outlet in the distribution system. In this method the water is conducted through the house-pipes by gravity. Another method is to provide an air-tight steel tank into the basement or some other convenient place. Water is pumped into the tank against air pressure. The air pressure in the tank then forces the water throughout the house-pipe system.

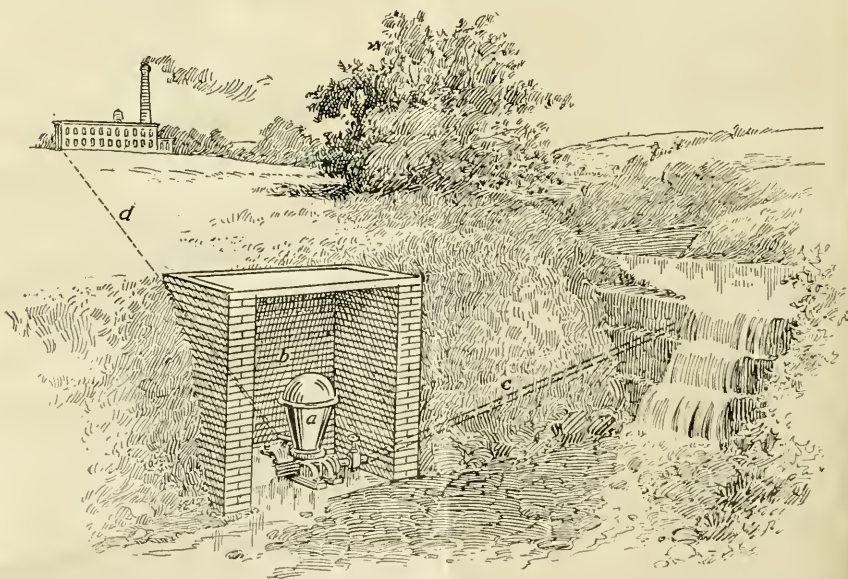


FIG. 13. Hydraulic ram. If a stream of good water, having a fall of 5 feet or more in a hundred feet, flows within a reasonable distance of the premises, a hydraulic ram may be used to pump water into a suitable house tank. The manner of connecting a ram is shown in Fig. 13. The ram (a) is located in a masonry pit (b), where it should be protected from frost by banking earth around the walls. The drive pipe (c) from the source of water supply, which in the figure is a dam made in the stream, is connected to the inlet tapping of the ram, and the discharge pipe (d) is extended in a trench to the house, where it supplies a tank located in the attic. The level of the ram should be at least 2 feet below the level of the inlet to the drive pipe.

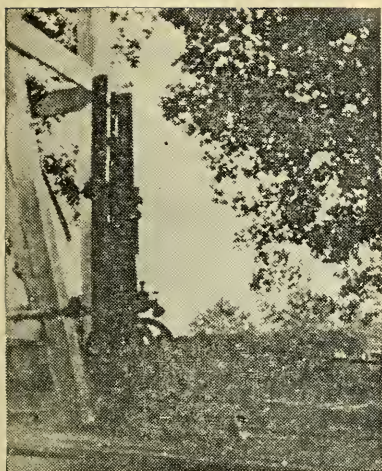


FIG. 14. Pump jack operated by gasoline engine and belt.

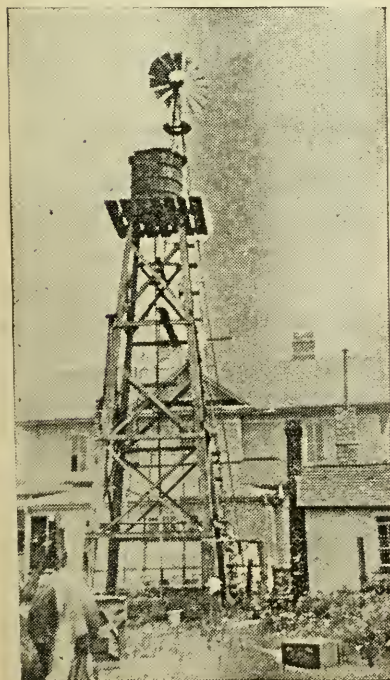


FIG. 15. Elevated storage and pressure tank, with windmill for operation of pressure pump.

**The Piping System.**—Pipes and fittings of suitable dimensions and materials should be prescribed and installed by a plumber.

The private waterworks system has important virtues in addition to adequate quantity and quality of water for drinking purposes: (1) Ample bathing facilities are thus made possible; (2) the way is opened for installation of flush closets; (3) the overburdened housewife is relieved of much drudgery which she could otherwise hardly escape; and (4) greatly increased protection is afforded against fire.

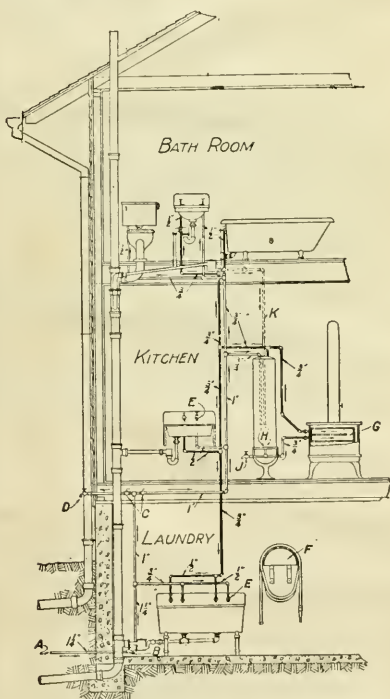


FIG. 16. Section showing inside piping system. An arrangement of pipes and fixtures in a well-plumber farm house. A, service pipe to house; B, stop and waste cock; C, stop cock; D, sill cock; E, hose bibb; F, hose and homemade, half-round wooden hose hanger (hanger may be made by nailing lagging to two half-heads of a barrel); G, kitchen range and water front; H, range boiler; J, hose bibb for draining boiler; K, return pipe (not absolutely essential, but improves the circulation of hot water and is of particular value where hot-water faucets are located far from the boiler).

## PUBLIC WATER SUPPLIES

The waterworks and distribution systems of a city are comparable to the heart and arteries in the body of a gigantic animal. The functioning of the waterworks system is just as essential to the life of the city as the heart beat is to the animal. If the great engines of a city pumping plant should stop, industry, traffic, and domestic operations would also stop. The accumulation of filth in unflushed toilets would soon become intolerable. Furthermore, upon a city without water, distress, suffering, and perhaps death from thirst, would promptly descend; and destruction by fire would be imminent.

When a village outgrows its limits it acquires at the same time both a new vision and a new name. It thereafter prefers to be called a town or even a city, and seeks for improvements necessary to the convenience and safety of its citizens. Waterworks, sewers and electric lights are not to be considered in the light of refinements in communities that have outgrown village proportions. For the sake of preservation of health and property, these things are demanded. A public water supply provides:

1. An abundance of pure water for domestic purposes.
2. Water for flushing of toilets and the carrying away of domestic and industrial wastes.
3. Reduction of fire hazard and the attendant lowering of insurance rates.
4. Business development, attracting industries which must have an abundance of water.
5. Water for public fountains and flushing of streets, making possible "the city beautiful."

A public water supply not only affords the utmost conveniences and advantages to a community, but may

be secured at an expenditure per residence less than that necessary for a private water supply system.

### ELEMENTS

The waterworks system may be divided into three sections, as follows:

1. Works for collection.
2. Works for purification.
3. Works for distribution.

Works for the collection of water may consist of:

1. Wells.
2. Springs.
3. Impounding reservoirs, or artificial lakes.
4. Intakes from rivers and natural lakes.

Works for purification of water may consist of:

1. Filter plants.
2. Sterilization plants.
3. Water softening plants.

Works for the distribution of water consists of:

1. The pumping plant.
2. Elevated pressure tank or stand-pipe.
3. A system of pipes, valves, hydrants, faucets, etc.

### PURITY OF WATER

Pure water, in the sense that it should not contain any other substance whatsoever, is not found in nature, except in the case of condensed vapor of the clouds, which, in the process of evaporation, has left all impurities behind. The above use of the term purity must be sharply distinguished from the sense in which we use it to signify freedom from germ life alone. Yet even condensed vapor absorbs impurities from the air and is no longer pure when it reaches the earth in the form of rainfall, snow, dew, or hail. The rainfall is disposed of in three ways: (a) Evaporation again into the air; (b)



surface runoff; and (c) soaking into the earth. Only the surface runoff and water percolating into the earth are directly available as sources of water supply. Impurities differing in character with respect to the course followed, are picked up by all waters. Yet these impurities are objectionable only in accordance with the use to be made of the water.

In the process of passage downward through the layers of the earth, to the subterranean reservoirs which are tapped by wells and utilized as a source of water supply, disease-producing bacteria are in most instances eliminated. The extent of elimination of bacteria depends upon

usually of such nature as to be detrimental for domestic purposes.

That portion of rain water which neither evaporates nor soaks into the ground finds its way into the nearest water courses. This, together with water from springs, sewage, and other drainage products, constitutes the stream flow.

While the chemical compounds, which give rise to difficulty in industrial operations are usually present in surface waters to much less extent than in well water, germ life in the former is much more abundant than in the latter. Since streams are the natural channels for removal of domestic and industrial wastes, the

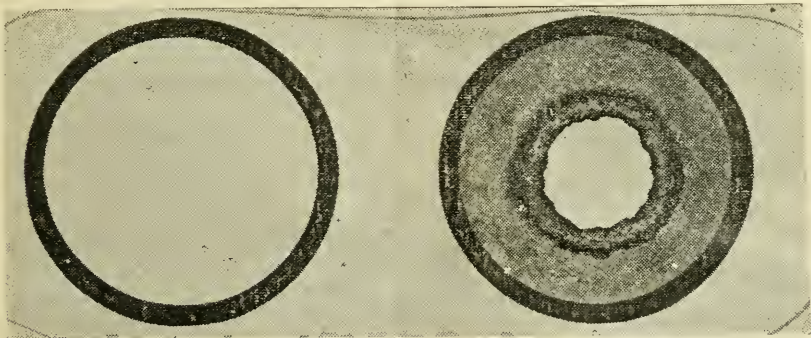


FIG. 17. Sections cut from boiler tubes showing the effects of incrustants.

the depth and character of the earth layers penetrated. Deep well waters are therefore usually free from bacterial contamination, and are for this reason particularly adaptable for sources of water supply for domestic use. Certain minerals and chemical compounds, contained in the earth become dissolved in the water, and sometimes render it unsuitable for industrial uses on account of the heavy incrustations that are deposited from water saturated with such substances, on the inside of water pipes and boiler tubes. These chemical impurities, however, are not us-

presence of great quantities of bacteria in surface waters is readily explained. The extent of stream pollution varies in direct proportion with the density of population on the area drained by the stream. Even the water from an entirely uninhabited watershed cannot be considered safe for drinking purposes, unless a suitable method of purification is employed. The carelessness of even one irresponsible person who might chance to deposit fecal matter on the drainage surface from which a town receives its water supply might be sufficient to inaugurate an epidemic

of disease among the consumers of such water if used in the raw or unpurified state. Instances of this kind are not unknown. Hence arises the necessity for purification of all surface water supplies. It is often heard that flowing streams will purify themselves every seven miles. This is by no means true. Some purification does indeed take place, but not to such a degree as to render the water safe for drinking purposes.

### WELLS

The same principles as outlined in a preceding article of this *Bulletin* entitled, "Sources of Water Supply for Farm and Village Homes," apply with equal force to wells for public water supplies, and need not be repeated here. The chief points of consideration are:

1. The securing of a well or system of wells that will furnish a sufficient quantity of water.

2. Location at a point remote from sources of contamination. In any instance the town should control, by ordinance, the property within a radius of two to five hundred feet around the well.

3. Protection at the top to prevent direct contamination.

4. Adequate surface drainage around and away from the well.

The majority of water supplies for small towns are secured from wells. Wells are indeed the ideal source of water supply for small towns, since a well water supply can usually be secured at a much smaller initial cost than a surface supply, which requires certain necessary purification facilities. Furthermore, the quality of water from wells is less dependent upon the skill and faithful attention of the plant operator, than is the quality of water from surface sources. The greatest difficulty, however, is that it has, so far, been found impossible in many sections of the State to

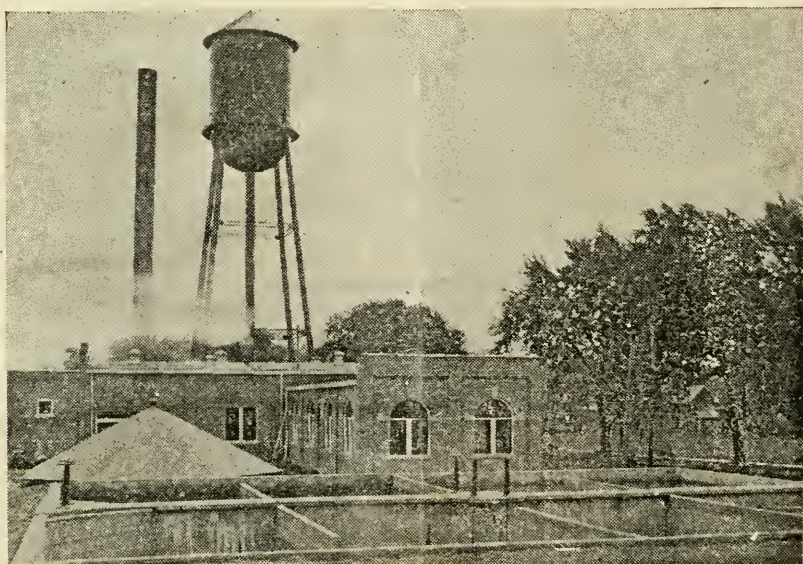


FIG. 18. Water purification plant showing settling basins in the foreground, filter house, and elevated pressure and storage tank in the background.



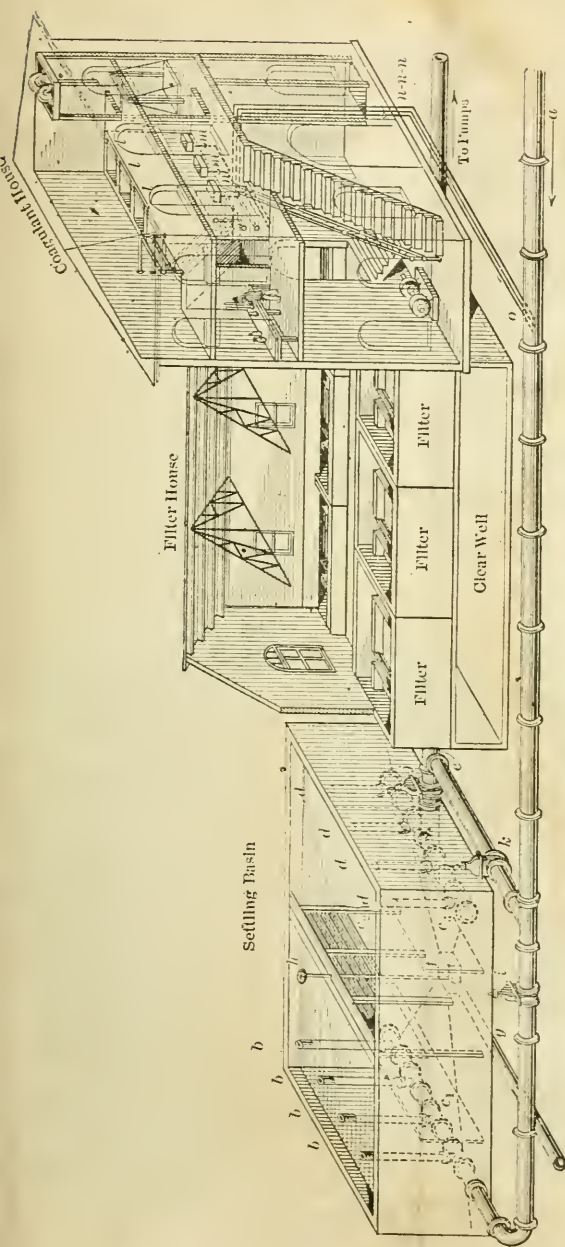


Fig. 19. General view of a mechanical filter plant. The settling basin is constructed of reinforced concrete. The water enters through the inlet manifold, terminating in the risers (bbbb), which may extend above the water, acting as aerators as shown, or not, according to the conditions to be met. The basin is provided with baffles, C-C-C- whose function it is to prevent undercurrents and to maintain a uniform flow throughout the basin. After passing through the basin the water is collected by the risers (dddd) of the outlet manifold and carried to the filters through the settled water main (e).

The floor of the basin is of smooth concrete with a decided pitch from all sides toward the center, where a sump (f) is located. In this sump is a drain valve operated by a hand-wheel (h), by means of which the basin may be emptied for cleaning through the drain (g). After being emptied, the remaining mud is washed out through the drain by means of a hose. Fig. 19 shows a single basin, which necessitates either shutting down while cleaning, or by-passing the water directly to the filters by closing valves (i) and (j) and opening valve (k). Many plants have duplicate basins, one of which may be cleaned at a time without interference with the operation of the plant.

**COAGULATING APPARATUS.** The coagulant house shown is three stories high. The first floor forms the main entrance to the filter house, contains the wash-water pumps, air compressor, receiving room, and storage for coagulants, stairway to upper floors, etc. The second floor contains the combined office and laboratory, the solution tanks (llll), and orifice boxes (mmmm), from which pipes (nnnn) carry the coagulant solution and discharge it into the raw water main (a) at (o). Sometimes additional coagulant pipes are provided so that the coagulant may be introduced at the center baffle of the settling basin, C-2, or into the settled water main (e). The third floor is on a level with the tops of the solution tanks and is used for changing these and for coagulant storage. It also contains a scale for weighing chemicals and the stirring apparatus of the tanks. An elevator or hoist is installed, serving all floors, but primarily for carrying up barrels and sacks of coagulant to the third floor.



secure wells that will furnish an adequate quantity of water for a town of any considerable size.

### PURIFICATION OF SURFACE WATERS

Modern methods of water purification may seem to be a new idea but the methods of the present day are only an improvement on those used by the ancient Chinese, who, before the Christian era, practiced sedimentation assisted by the same chemicals that are still in common use. Further verification of the fact that water purification is an old subject is found in 2 Kings II, 19-21, "And the men of the city said unto Elisha, Behold, I pray thee, the situation of this city is pleasant, as my lord seeth: but the water is naught, and the ground barren. And he said, Bring me a new cruse, and put salt therein. And they brought it to him.

And he went forth unto the spring of the waters, and cast the salt in there, and said, Thus saith the Lord, I have healed these waters; there shall not be from thence any more death or barren land." The reference in this passage to the removal of impurities by means of harmless salts, in close accord with modern practice, seems capable of but one interpretation.

The common methods of water purification for domestic purposes are:

1. Sedimentation and sterilization.
2. Filtration
  - (a) Slow sand filters.
  - (b) Rapid sand, or mechanical filters.
3. Sterilization alone.

The procedure which is most depended upon in North Carolina is filtration by the mechanical process,

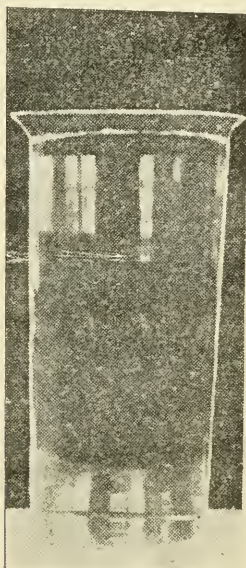
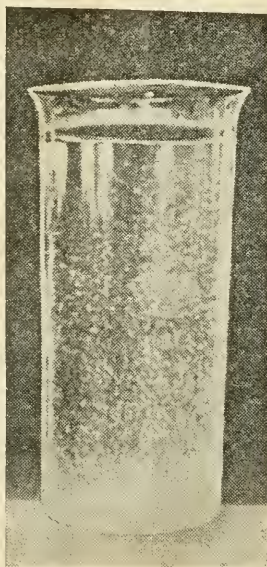


Fig. 20. Clear water



Showing coagulation.



During subsidence.

An illustration, showing the appearance of water at three successive stages of coagulation. Note in the second instance the similarity of appearance of settling flakes of coagulant to falling snow flakes.

though no single method is ordinarily sufficient in itself. Combinations of the foregoing methods are considered almost essential. See Fig. 19. No filter plant is complete without the installation of sterilization equipment for the protection of the water supply in emergencies even though it may not be required for constant operation.

### COAGULATION AND SEDIMENTATION

Water is pumped directly from the storage reservoir or river into the settling basins. See Fig. 19. It is allowed to stand in the settling basins for a period of hours, for the purpose of allowing silt, sand, mud and detritus to settle out, before turning it onto the filters. To assist and hasten the settling process, chemicals

are added which, when mixed with water, form curd-like flakes that gradually settle to the bottom. When looking down into the water one is reminded of the falling of large snow-flakes in a heavy snowstorm. As these flakes settle they surround and carry down with them, the silt, sand, mud and other foreign matter in the water. Great quantities of bacteria are removed also in this manner. After settling, the water is applied to the filters.

### FILTRATION

A filter consists essentially of a bed of sand and gravel of suitable character and depth, provided with a system of underdrains for the collection and removal of the filtered water. Fig. 21 shows the essential features of a mechanical or rapid

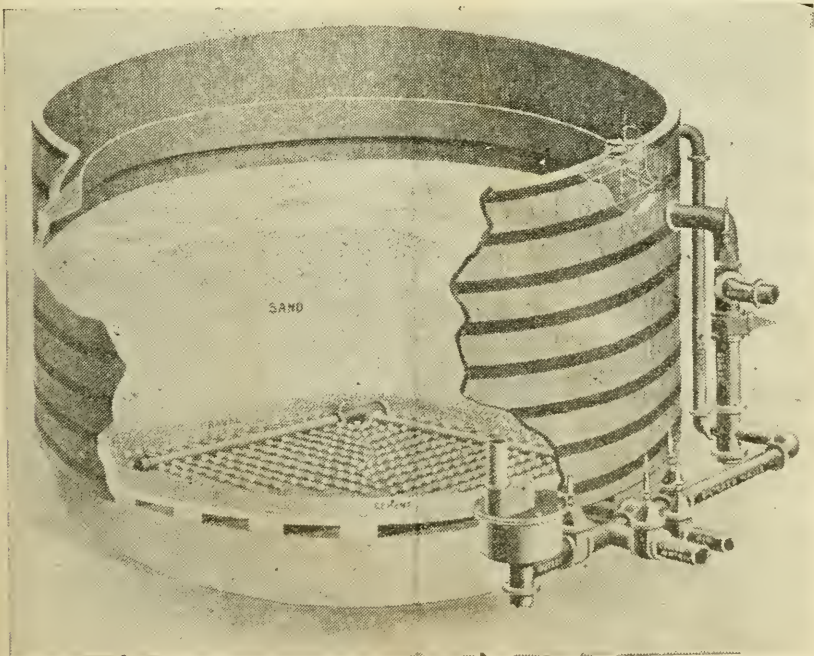


FIG. 21. Mechanical sand filter, showing successive layers of sand and gravel superimposed upon a system of underdrains.

sand filter. The water passes down through the sand layer, thence through the underlying layer of gravel, and reaches the collecting system. It then passes through a multitude of tiny holes in special strainer devices, into the underlying drain pipes, and through these finally to the clear water basin where the filtered water is stored until pumped into the distribution system. In passing through the filter the solid matter suspended in the water is held back on the surface of the sand. A certain amount of the curd-like flakes that form in the process of coagulation which takes place in the sedimentation basin are carried over onto the filters. As these flaky masses of chemical settle out on the surface of the sand, they form a jelly-like layer over the entire surface. Filtration is commonly considered merely a straining process. To a certain extent this conception is true, but rapid sand filtration would be impossible without the assistance of coagulating chemicals. After a period of several hours, the mat on the surface of the sand accumulates to such an extent as to impede materially the passage of water through the filter. It then becomes necessary to wash the filter. For this purpose the flow through the filter is reversed by water under pressure from beneath.

### STERILIZATION

Sterilization is necessary for the protection of any surface water supply whether filtered or unfiltered. An unfiltered surface water supply, from even an entirely uninhabited watershed, is subject to pollution at all times because it is humanly impossible for the watershed keeper to maintain supervision over all points of the watershed at the same time, no matter how vigilant he may be. The purity of the water that has been

passed through filters is dependant upon the intelligent ability of the plant operator and the faithful attention which he devotes to the process. Unfortunately many of our filter plants are operated by men not qualified by training and experience. The human element involved in water purification is very great, and every water customer should recognize that therein lies his hope of safety. The man who serves a town or city with its water, therefore, should have a well established record for intelligence, training and reliability.

Sterilization of water is the destruction of disease producing bacteria which may exist therein. The two common methods are: (1) Treatment with hypochlorite of lime (sometimes called bleaching powder) and (2) Treatment with liquid chlorine. Hypochlorite of lime is a dry chemical and has to be mixed with water in specially designed mixing boxes. The resultant solution is then fed into the water in the proper quantities. This method is difficult to operate, uneconomical, and is gradually being displaced by the use of liquid chlorine. The liquid chlorine is shipped in large steel cylinders which are filled under high pressure. The liquid becomes a gas upon release from pressure through the opening of a small valve. In Fig. 22 is shown a liquid chlorine machine by which the gas is mixed and dissolved in water. By adjustment of the apparatus, the rate of addition of chlorine gas to the water is controlled.

### COST OF STERILIZATION

The cost of sterilization equipment is financially within the reach of any town. Equipment suitable for the smaller plants would cost approximately \$500. There are probably not more than three plants in the



State for which the equipment would cost as much as \$750.

The cost of chlorine per million gallons of water treated is from 20 to 60 cents. Including all factors of expense such as interest on investment, depreciation, cost of chemicals

### PUBLIC WATER SUPPLY SUPERVISION AND PLANT OPERATION

Regardless of the care and skill which are exercised in the selection of the source of a public water sup-

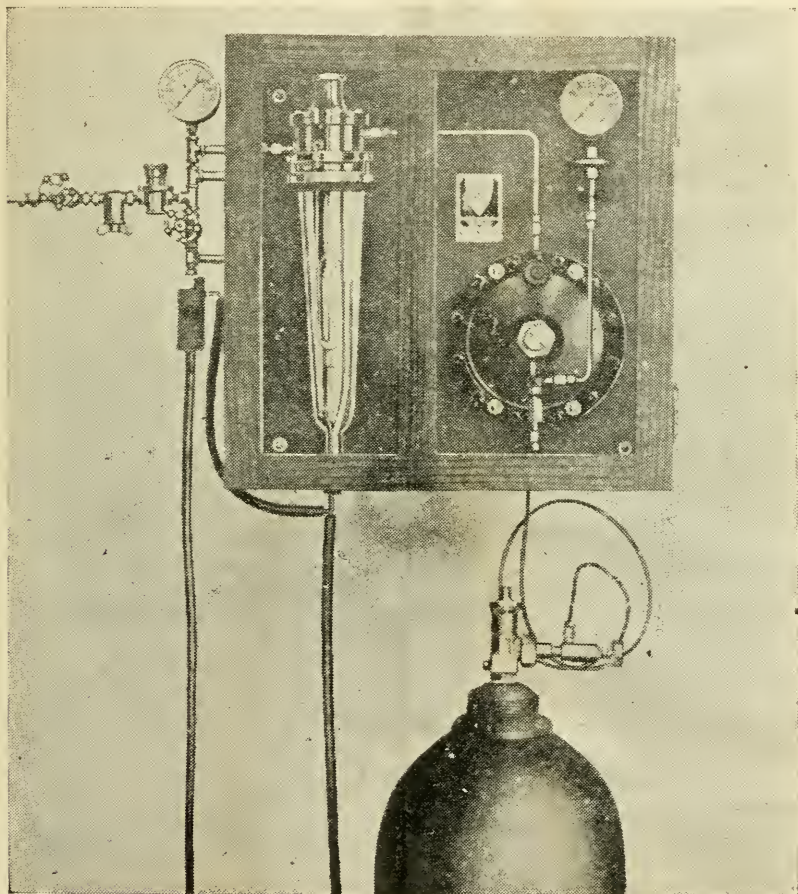


FIG. 22. Mechanical feed apparatus for dosing water with liquid chlorine.

and all other expenses, the water supply for a city of 20,000 inhabitants can be sterilized for 4 cents per person per year. For cities from 8,000 to 10,000 inhabitants the water can be sterilized for 5 to 6 cents per person per year.

ply, and in the design and construction of the purification works, the public water supply may constitute either a blessing or a menace to the community, depending upon the character of service which the plant operation receives.

To insure a continued purity of water from wells, the purity of the supply must first be determined by laboratory examination and checked by re-examination at frequent intervals, to make sure that no pollution has occurred. The plant operator should exercise utmost care to prevent any possibility of pollution existing about or in the vicinity of the wells.

The protection of surface water supplies, however, presents a much more difficult problem. Some of the essentials are:

1. Patrol of the watershed to prevent undue pollution of the raw water.
2. Provision of simple laboratory equipment, sufficient for the ordinary tests, and determination of the presence of disease bacteria.
3. Daily examination to determine presence of germs in water.
4. Examination of the water for the purpose of determining the quantities of chemicals required to accomplish the desired result.
5. A plant operator thoroughly qualified by training and experience to perform the foregoing tests and make use of the information thus obtained.

In spite of these obviously essential qualifications, some towns still choose their plant operators as they would select a janitor. It is even possible to find instances where the highest qualification demanded of a plant operator is that he be the laborer who turned the first shovelfull of dirt in the construction of the plant. A manufacturer would not select his superintendent of production in this manner, nor should the people of a town or city be willing to take any such hazards with respect to the man who so intimately presides over their destiny.

## THE TWO BEST PAYING INVESTMENTS A TOWN CAN MAKE

1. A Properly Designed and Constructed Water Plant.
2. A Thoroughly Competent Plant Operator.

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*NOTE.—The importance of Item 2 is equal to, if not greater than that of Item 1.*

## RESULTS OF MONTHLY ANALYSES OF PUBLIC WATER SUPPLIES

## SURFACE SUPPLIES

Town	Filtered	Chlorinated	Samples Submitted Out of Possible 25	Polluted	Percentage of Pollution
Albemarle.....	yes.....	yes.....	18	0	0
Andrews.....	yes.....	yes.....	22	9	40
Asheboro.....	yes.....	yes.....	23	2	8
Asheville.....	.....	.....	14	5	28
Biltmore.....	.....	.....	20	6	30
Bessemer City.....	yes.....	yes.....	22	0	0
Badin.....	yes.....	yes.....	7	1	14
Black Mountain.....	.....	.....	13	1	7.7
Brevard.....	.....	.....	21	6	2.8
Bryson City.....	.....	.....	23	7	30
Canton.....	yes.....	yes.....	20	3	15
Carthage.....	.....	.....	24	4	16.6
Chapel Hill.....	yes.....	yes.....	17	5	34
Charlotte.....	yes.....	yes.....	16	0	0
Concord.....	yes.....	yes.....	18	1	5.5
Durham.....	yes.....	yes.....	13	0	0
Elizabeth City.....	yes.....	yes.....	25	1	4
Elkin.....	yes.....	yes.....	23	2	8.7
Fayetteville.....	yes.....	yes.....	25	0	0
Gastonia.....	yes.....	yes.....	21	0	0
Goldsboro.....	yes.....	yes.....	13	0	0
Greensboro.....	yes.....	yes.....	24	6	25
Greenville.....	yes.....	yes.....	20	6	30
Hamlet.....	yes.....	.....	22	0	0
Henderson.....	yes.....	.....	24	0	0
Hendersonville.....	.....	yes.....	16	2	12.5
Hickory.....	yes.....	yes.....	21	5	24
High Point.....	yes.....	yes.....	18	8	44
Lenoir.....	.....	.....	22	5	23
Louisburg.....	yes.....	yes.....	24	7	29
Lumberton.....	yes.....	yes.....	18	2	11
Marion.....	yes.....	.....	20	1	5
Mount Airy.....	yes.....	yes.....	18	5	28
Murphy.....	yes.....	yes.....	23	8	35
North Wilkesboro.....	yes.....	yes.....	23	2	8.7
Pine Bluff (springs).....	.....	.....	18	6	0
Pinehurst.....	yes.....	yes.....	19	9	47
Raleigh.....	yes.....	yes.....	24	1	4.1
Reidsville.....	.....	.....	19	2	10.5
Rocky Mount.....	yes.....	yes.....	20	1	5
Salisbury.....	yes.....	yes.....	15	0	0
Saluda.....	.....	.....	5	4	80
Sanford.....	yes.....	yes.....	21	1	4.8
Scotland Neck (springs).....	.....	.....	21	2	9.5
Shelby.....	yes.....	yes.....	19	1	5.3
Smithfield.....	yes.....	yes.....	19	6	3.2
Southern Pines.....	yes.....	.....	22	0	0
Spencer.....	.....	.....	21	2	9.5
Statesville.....	yes.....	yes.....	22	3	13.5
Tarboro.....	yes.....	yes.....	20	0	0
Tryon.....	.....	.....	20	10	50
Wadesboro.....	.....	.....	12	4	33.3
Washington.....	yes.....	yes.....	22	1	4.5
Waynesville.....	.....	yes.....	16	2	12.5
Weaverville.....	yes.....	.....	20	9	45
Weldon.....	yes.....	yes.....	23	1	4.3
Wilmington.....	yes.....	yes.....	14	1	7.1
Wilson.....	yes.....	yes.....	22	4	18
Winston.....	yes.....	yes.....	20	0	0
Salem.....	yes.....	yes.....	22	1	4.5



## WELLS

Town	Number Samples Submitted Out of Possible 25	Polluted	Percentage of Pollution
Ayden.....	21	1	4.7
Benson.....	1	1	100
Burlington.....	19	6	37
Chadbourn.....	13	5	38
Cherryville.....	20	5	25
Clayton.....	22	4	18
Davidson.....	21	2	9.5
Dunn.....	13	4	30
Edenton.....	11	0	0
Elm City.....	25	1	4
Farmville.....	23	0	0
Forest City.....	14	2	14
Fairmont.....	17	0	0
Franklin.....	17	1	5.9
Graham.....	22	4	18
Hertford.....	16	3	19
Kings Mountain.....	17	1	5.9
Kinston.....	23	1	4.3
LaGrange.....	4	0	0
Laurinburg.....	17	1	5.9
Lexington.....	20	8	40
Lillington.....	16	3	19
Lincolnton.....	24	4	16.6
Marshall.....	20	8	40
Maxton.....	18	0	0
Monroe.....	18	1	5.5
Mooresville.....	23	1	4.3
Morehead City.....	22	1	4.5
Morganton.....	22	5	23
Mount Olive.....	17	5	29
Nashville.....	16	1	6
New Bern.....	24	4	16.6
Newton.....	21	0	0
Niagara.....	12	0	0
Oxford.....	23	5	22
Plymouth.....	15	3	20
Raeford.....	15	0	0
Red Springs.....	20	5	25
Rowland.....	14	0	0
Roxboro.....	22	2	9.2
Rutherfordton.....	23	1	4.3
Selma.....	22	3	13.6
Southport.....	19	0	0
Thomasville.....	20	7	35
Warrenton.....	20	0	0
Wrightsville.....	5	2	40

## COMMERCIAL SPRING WATERS

SPRING—			
All Healing.....	13	2	15.3
Buckhorn.....	7	2	28.6
Buffalo.....	15	0	0
Davis.....	3	2	66.6
Derita.....	14	5	35.6
Dunlap.....	9	1	11
Fuquay.....	6	0	0
Huckleberry.....	13	1	7.7
Lincoln Lithia.....	7	3	43
McDaniel.....	14	1	7.1
Moore's.....	17	4	23.6
Mount Vernon.....	4	0	0
Panacea.....	1	1	100
Piney Mountain, Tryon.....	13	3	23
Rivermont.....	17	0	0
Seven Springs.....	9	0	0
Shelby Lithia.....	3	0	0
Hot Springs.....	17	10	60



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BACK TO SCHOOL AGAIN

SPECIAL SCHOOL HEALTH NUMBER

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## EDITORIAL

BY G. M. COOPER, M.D.

### THE LAND WE LIVE IN

"He hath brought us into this place, and hath given us this land, even a land that floweth with milk and honey."—Deut. 26:9.

About seventy-five years ago Balzac selected a tiny village settlement in a remote section of France and wrote a story depicting the simple lives of everyday people as reflected in the daily life of a country physician. The title of the book he called "The Country Doctor." While the story was written entirely about the common cares of common people in an insignificant hamlet, there is nothing provincial about it; for it has all France and all the world for a background. The problems

which confronted the doctor and his patients in the little town were problems as old as civilization, and will serve as a mirror for all the world as long as time lasts. Would that we had a Balzac to write the literature of North Carolina today as he spoke the language of France three-fourths of a century ago. We have been accused of provincialism, and ignorance, and poverty, and mediocrity in this State so long that many of our people have come to accept all of it as a matter of course. Our little mannerisms and crudities, inherited through scores of generations of ancestry, untainted and unchanged by city influences, have made us the butt of ridicule by outside writers to a greater extent than any state in the Union, ex-



cept Arkansas. We have faults, and they are many, but our chief virtue has been an abiding faith in our State. True, for fifty-five years the cards have all been stacked against us, since Sherman burned even the growing wheat in our fields: and we have labored against odds that would have long since discouraged a less-determined people. Out of this period of hardship we have the high privilege of finding our State to-day worth in round numbers on the tax books over \$3,000,000,000. Think of it, three billion dollars! We paid the past year more federal taxes to support the United States government than any State in the South, twice as much as any Southern State except Texas; and only five States in the Union paid more than we did. We have more cotton factories than any State. We rank fourth in the value of our crops. We have a greater diversification of industry, crop production, soil and climate than any State. Our State has been made what it is solely by the people who live and have lived in it, within the providence of God. We have no cities, even of moderate size, but we have a much harder problem in that we have a great number of places from 100 to 5,000 population. It is these villages and small towns in which our school and economic problems are more acute; and in which our preventable disease problem is much harder to control, all of which leads up to what we started to say. It is in the power of the present generation to make North Carolina incomparably the greatest State in the Union. The only way this ideal may be achieved is to work incessantly with and for our children by giving them the best possible educational advantages, including the most important features of all education, viz.: home care and training, removal of all physical defects and providing for each child full physical development along with strong moral and mental training. Unless this is

done, the time will come when all the wealth of all the farms and factories and banks of the State might as well be a jumbled pile of ruins.

---

## FOUR THINGS TO DO BEFORE SCHOOLS OPEN

1. Select the right sort of teacher. Make it a point to be as careful in the selection of your children's teacher as you are in purchasing a new automobile. Try to make up your mind, regardless of what the neighbors say, to spend at least one-tenth as liberally on the teacher's salary and the school as you do on the up-keep of the automobile.

2. In the country and village districts, if there is no "teacherage" to provide homes for the teachers, while you are building one, secure a good place for the teacher to board, with a warm room and good bed to be occupied alone if preferred; and a place where all the dogs in the neighborhood do not eat in the dining-room at the same time the teacher and the family do. In the larger towns and cities see that the teacher is provided with a good, comfortable boarding place, without requiring all the salary to pay for.

3. Have all the school grounds thoroughly cleaned up, the pump or other water-supply put in first-class shape, the school building cleaned from bottom to top, the floors oiled, and all broken window lights replaced, ventilation through top of windows provided, good heating facilities with stove-pipes braced and riveted; and in all small town and country schools see that approved type of sanitary toilets are provided for both sexes. Good comfortable seats adjustable for small and large children should, of course, be provided. All of the above should be attended to the week before schools open and not the week after.

4. The children should be taken to the family dentist and their teeth put

in first-class condition. The family physician or whole-time health officer should be requested to examine the throat of every prospective pupil, also test the hearing and vision. If any defect is found it should be corrected in so far as is possible before entering school. The week before the scheduled opening of schools the teacher or an interested committeeman should find out upon inquiry of the county health officer or quarantine officer whether or not any communicable disease is existent in the community. Each child should be provided with an individual drinking cup and compelled to use it throughout the session.

5. Remember that a crop of cotton cannot be expected unless proper seed are sown in the right kind of soil and assiduously cultivated on through to harvest time by a farmer who understands the business and who has the necessary tools with which to work. No more can satisfactory results be obtained from school work unless the teacher is an expert and has the necessary equipment, and suitable environment in which to work, than could a crop of cotton be obtained by a blacksmith working in his shop.

## ROCHESTER AND RALEIGH

Far up near the shores of Lake Ontario in the northern part of New York State is situated the city of Rochester. Recently one of its citizens, a man named Eastman, presented to the city a free gift of five million dollars. At the same time the General Education Board matched this amount from Mr. Rockefeller. Think of it, *Ten Million Dollars* to build a great medical college! More money than the University of North Carolina and all the colleges in the State for men and women (with the possible exception of Trinity) combined would bring if put up and sold at auction to the highest bidder. Rochester, a

city of some two hundred and fifty thousand people, is to have one of the greatest medical schools in the world, through the philanthropy of two individuals, while all the State of North Carolina, with two and one-half millions of people, has no medical college of any description conferring full medical courses with degrees.

Let the reader take a map and draw two circles, one having Rochester, N. Y., as the centre of a sixty mile radius, the other having Raleigh, N. C., as the centre for the same size circle. A reference to the Federal Census figures will show that in the circle around Raleigh there are living almost as many people. The need for a really great medical school in North Carolina and for increased hospital facilities all over the State is much more acute than in Rochester.

The writer is possibly "old fashioned" but it seems to us that the reaction against the present methods of turning out quantity production by the medical schools like making pressed brick must soon set in. Before a young man should be allowed to qualify as a physician, to sit in judgment over life and death for his fellows, he should have every particle of individuality he possesses trained to the last degree. He should be trained as an out and out idealist with his feet on the ground. These things can never be done in the biggest colleges, where the chief requirements are that the student has plenty of money and that he has qualified for entrance by so many years in physics and chemistry. He must be so many inches high, weigh so many pounds, have a certain chest expansion, have good teeth and know how to wear a dress suit.

One of the morals intended here is that it is high time some of our people, besides Mr. Watts and the Sprunts, began to realize the grave responsibility for extended medical and hospital service to all the people of North Carolina.

## BEQUESTS AND DONATIONS

Each week, under the above heading in its general news department, the *Journal of the American Medical Association* publishes notices of funds given outright or by will to hospitals or medical schools. A careful perusal of this list for the past 15 years indicates that less than five per cent of such funds have been given to institutions south of the Mason and Dixon line. The result is that there is hardly a village anywhere in the North too small to boast a first-class hospital, certainly within easy distance to all the people, and with endowment sufficient to take care of all patients.

Is it possible that our more well-to-do classes are more callous to the suffering of their fellows than the same class of individuals in the North, when it comes to matters of financial liberality? It would certainly seem so; but let us hope that it is due to indifference and carelessness and that we will do better in the future. No sacrifice is too great for us to make for our children if we would build for our State a great and powerful citizenship.

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## ARE WE IN THE UNION?

No, we do not mean the Farmers' Union, nor the organization of which Mr. Gompers is the titular head. We mean is North Carolina really an integral unit of the forty-eight States. It seems not. A recent issue of *School Life*, a Federal Government publication, published by the Department of the Interior, Bureau of Education, at Washington, D. C., was designated as a "Health Education Number." North Carolina being a State of small sized cities and open country exclusively, the thirteen illustrations in that issue of the aforementioned journal, with probably two exceptions, and almost all the reading matter, are about as applicable to conditions and problems in this State

as a copy of the Koran at a Sampson County negro camp-meeting. From a description of the "epi-trochlear" glands of Kansas City school children to the Children's Outing Society of Milwaukee, all are on their way with Dorothy to the "Beautiful City," the "City of Happiness." Not one word is there to aid those of us who are giving our lives here in North Carolina in trying to help specifically the more than six hundred thousand school children whose early school advantages are dependent on the small country schools in the pine woods, the sandhills, and the mountain coves. We are running true to form and will probably so continue in governmental affairs from Constable to President as long as there is a government, in that matters of health teaching and physical education must be patterned after our history and geography text-books, all written first, last, and all the time from the city point of view, and the city only. The bigger and farther north the city is, so much the better. It is a matter like the teaching of history in our schools. We can take it or "leave it." We generally take whatever is offered with mumbled words of thanks. And still the wise ones continue to wonder why the boys and girls proceed, as they have always done, from farm to city to live. After all, government by politicians reflects more or less accurately the degree of interest manifested by the people. North Carolina being a rural State, will continue to take its intellectual pabula along with its medical diplomas and automobiles from the cities of the North until we really get to the point of believing in ourselves and our own destiny.

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## DISEASED TONSILS

A young school teacher down in eastern North Carolina, about seven years ago, had an attack of what his physician termed "rheumatism." After a few months of treatment his condition



became chronic. Failing to improve he tried first one physician and then another, just like other humans have done and will continue to do. Most of the physicians he consulted were men of average ability, of this State and Virginia. Finally despairing of any help from the "regulars" he visited an osteopath and was thoroughly treated by him. Failing there he got into the harness and had the pad of a chiropractor saddled over his spinal column and received "spinal adjustment," whatever that is. Next, a Christian Scientist "practitioner" told him he simply had "an error of mortal mind," and that otherwise there was not a thing the matter with him.

To end the story, a few weeks ago a wise friend persuaded him to visit a "group clinic" conducted by real scientific medical men. His whole trouble was found to be due to an infected tonsil. Removal of the cause by a good local specialist has already produced the desired results.

Jacob had nothing on this young teacher, although Jacob's seven years labor netted him a wife he did not want. The loss of time and expense of the teacher cost him a great deal more money, but as in Jacob's case the experience should be valuable.

The moral in this true story is easy to locate: If anything appears wrong with the physical machinery, especially of children and young people, skip over the guessers, as it will save time and money, and consult somebody who is capable of rendering honest advice and then act on the advice immediately.

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### "KEPT IN"

We sometimes wonder how many million times the above answer is made to parents by small children in reply to the query as to "Why late from school?" There is no one thing which contributes more to the sum total of constipation, irritability, poor nutrition, and general

ill health and unhappiness in later life than the vicious practice in many schools of forcing children to "stay in" after school. Thousands of active school children from the second to the seventh grades have to sit in their desks from nine o'clock in the morning until two and sometimes three in the afternoon with only two short periods of intermission. Now, add a few additional minutes after school, in a vast majority of cases for the most trifling and insignificant offense, and it constitutes nothing short of a disgrace to our civilization. The writer has always held that ignorance (not illiteracy) is the greatest curse in the world. Ignorance crucified Christ. Ignorance is the very breath of life to the demagogue. But if learning must be obtained through destruction of all the very fundamentals of good health, then we should cheerfully go back to primitive teaching methods, where the old type teacher would have contemplated cutting a child's throat just as quick as "keeping him in" for asking to "go out" during "books." If a teacher has not personality and force of character enough to control the pupils under his or her care without resorting to this abominable practice, close the school and let the pupils remain at home. On the other hand if a child is not amenable to some other form of discipline the teacher has the legal right to send him home. We here and now request every county superintendent and the head of every city school system in North Carolina to bring this question to the attention of every individual teacher with the demand that the practice be discontinued immediately and forever in this State.

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### TEACHING SCHOOL SUBJECTS

The writer was recently forced to listen to a most emphatic objection, by the head of an important city school system in Piedmont North Carolina to

the grade teacher having to work thirty-three minutes every three years under the medical inspection law in making a preliminary physical examination and recording the results. Think of it, the head of the schools objecting to the teachers sacrificing(?) eleven minutes time each year to each pupil in order to make a few simple tests which enables the teacher to find out definitely, among other things, which pupils may be slightly defective in sight or hearing and therefore entitled to front seats in the school room. The worst of it is this particular superintendent is otherwise a good man, and has the reputation of being at the top of his profession in his section of the State. The writer asked him to please state his idea of what constituted a school teacher's duties. His reply was, "Teaching school subjects." Instantly the writer called to mind the words of Frederick S. Jones, Dean of Yale University, recently quoted in the *Literary Digest*:

"There was a time when I thought that we must teach in college first and foremost the learning of books. In these days I would bend every effort to the making of good citizens, and by a good citizen I think I mean a man who is master of himself, and earns his own living, and as far as possible in doing it is of benefit to his fellow men."

The ideals of the State Board of Health School Health Service is based on the practical effort to assist the schools in making first of all better citizens. To do the job as it should be done the place to begin is by giving every child an even chance. Naturally the child suffering with any physical defect or handicap which is remediable, must have such defect removed before he can even start. The essential trouble in the way of carrying our program through to a great conclusion to the everlasting benefit of the coming citizenship of our State is first of all, too many parents are today trusting the moral, mental, and physical up-bringing

of their children to Divine Providence; and too many teachers believe only in "teaching school subjects." In the meantime the movie craze, the cold drink dopes, and the automobile mania is fast breaking down natural barriers that have always prevented the unrestrained commingling of very young boys and girls. To the aforementioned trio of pitfalls to the young also may be noted the constantly increasing use of cigarettes by boys in their early teens; and thus it is patent to any thinking person that we are fast laying the foundation for a nation of degenerates.

Verily, is it not time that all our teachers begin to teach something besides school subjects?

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## WORLD POLITICS AND N. C. CHILDREN

The sooner every man, woman and child in the United States is made to realize fully the fact that our country has not only nothing at all to gain but more to lose than any half-dozen countries combined on the face of the earth, in another world war, the better it will be for our future. The wars of the future, as in the past, will be caused by racial hatreds and prejudices, coupled with commercial ambitions. We are already cordially hated by half the world on account of racial antipathy and regarded with suspicion by the other half on account of our commercial activities; and our wealth is coveted by the whole world. It is certainly not jingoism to state that the only thing to stand between ourselves and utter destruction by some combination of our enemies in the future is to make of our nation a people of such physical and mental and moral stamina as to make impossible such a contingency. With a third of our young men incapable of assuming the arduous duties of army service in the recent European War, we have much to do to overcome our handicap.

Now the only logical place to begin, if we may expect results, is with the school children in the very first grades. And the first thing to do in the school is to find the child with a remediable defect and then and there set about having the defect remedied. Then the teaching of hygiene will be immediately in order and not before. A child with toothache or a discharging ear is in no position to listen to a learned lecture on "postural defects." It has been said that teaching hygiene has been the yellow dog in the average school curriculum. Our experience in North Carolina leads us to realize the necessity for preparing teachers properly in the schools which make a business of training teachers, if hygiene does not continue a misnomer. There should be a complete theoretical and practical department of personal hygiene and public health, including all phases of school health supervision, in every school and college in the State, and the course should be as complete and have identically the same value in pursuing a degree as mathematics. The department should be headed by a full professor. The tendency in so many of our schools to answer this demand by providing a physical director and calling it physical education would be ridiculous if it were not so serious. It does serve to create a false sense of security, which in reality does not exist, in that the patrons of the schools and their families are naturally led to expect health training which they do not and cannot get under the system.

As long as eighty per cent of our young men between twenty and thirty years of age are without most of their "six year" or first permanent molar teeth, as at present, a daily toothbrush drill in our public schools conducted when possible by a competent dentist is certainly of as much or more importance than any possible amount of physical exercise. Neither would constitute

a course in physical education, but both along with a great many other features are necessary, before a claim could be laid to teaching such a subject.

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## MOTHERS' PENSIONS

Of the making of books and of laws there is no end; but we are devoting this paragraph to advocating one more law, and that is a pension for mothers. Every mother in North Carolina giving birth to a child should be entitled to a "pension" sufficient to defray the expenses of good nursing and medical care for at least three months, beginning one month before the birth of the baby. No single act of like cost would contribute more toward the health of both mother and child and to the general comfort of many homes through a critical period. We are moved to this observation here and now through knowledge of numbers of refined women jeopardizing their lives and ruining their health by being forced to resume their housework before being physically able. Nobody is prepared to state just what effect on infant mortality the neglect of babies through mothers having to work out for a living has, but it is known to be serious.

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## A MILLION DOLLARS

One often hears children ask each other "What would you do if you had a million dollars?" Here is what the Director of the Department of Medical Inspection of Schools of the North Carolina State Board of Health would do with an "official million" if he had it.

1. Select one big room in the high school building at each county seat of the State's one hundred counties and divide it up, and equip a first-class eye, ear, nose, and throat and dental clinic for all of the county's school children.



2. Employ a first-class capable school nurse and place her in the county the year round for the purpose of getting every school child needing the service to take advantage of the clinic.

3. Employ at least two capable eye, ear, nose and throat specialists for their whole time to conduct clinics for rendering full medical and surgical treatment to every school child needing it, regardless of the social or financial standing of the child's parents.

4. Employ a sufficient number of the best dentists to treat free of charge the teeth of every school child needing it, the children from all over each county to be brought to the clinic for the treatment.

5. At the end of the year have money left, and the satisfaction of knowing that more lasting good had been done to more people than for any like expenditure in the history of the world.

The million would be one-twentieth the cost of a single battle cruiser, which would be junked as obsolete before the first amalgam filling fell out of the first tooth treated. The million would also be over one hundred and sixty-nine times less than the amount our own North Carolina people paid the United States Government in Federal taxes last year to help build battleships and pay the salaries of politicians from Ohio and New York.

## THE HOT SCHOOL LUNCH

As the nutrition of school children is a question of probably more importance than any other single item, we expect to keep on hammering away on the subject until every school in North Carolina, large and small, makes provision for at least a modified hot lunch at noon. Here is a practical suggestion: Secure an ordinary two-burner oil stove with a detachable oven, all kettles and pans necessary, a small fireless cooker, also a small serving table. Prepare the food to be served early in the morning, place in the fireless cooker. At noon, after the children have five or ten minutes to wash their hands, let them take their places at their desks, have two larger girls preside at the serving table, and let them march up in order in "Cafeteria" style and be served, returning to their seats. They will not spill the food either. Suggested menus: Mashed potatoes served with milk gravy twice a week; good vegetable soup with plenty of tomatoes and beans, twice a week; and cocoa, rich in milk with a minimum of cocoa, once a week. The above is supplementary to the cold lunch brought from home, of course. Provide each child with a large aluminum cup with a handle, a teaspoon and a paper napkin. Not a school in North Carolina is too poor to carry out such a program. It is up to the teacher.

# MEDICAL INSPECTION OF SCHOOL CHILDREN

The Greek ideal of a "sound mind in a sound body" made their civilization the greatest of all time. But for the fact that they neglected the third necessary pillar to the triangle, they might have continued their dominant power to this day. That third pillar is religion, morality. There are three great divisions in education, each of equal importance. The individual, or community or nation that neglects one, no matter which one, long enough is doomed to utter failure and ruin.

First—Physical, the development of a sound body.

Second—Mental, a cultured mind.

Third—Spiritual, moral and religious training.

The Greeks neglected the third and their nation died. The Romans eventually neglected all three and perished. The Spanish paid no attention to the first and failed. The Germans overdid the first to the neglect of the third, and, of course, failed miserably. Russia and Mexico are living examples before the world today of nations neglecting all three fields, but especially the second and third. There has been a widespread tendency throughout the world for the Christian nations to look with contempt on any kind of physical education. In other words, "book learning" in a very narrow groove, has been the ideal.

The physical condition of the child has been of little or no interest to the average teacher in the past and most teachers have frowned upon all those making an honest effort at improvement along this line. Many school boards and superintendents, as well as teachers, have been openly hostile, and have looked upon the activities of the average health officer and medical inspector of schools and school nurse as simply the fad of a bunch of fanatics. In short, a nuisance. This particularly

applies to the better educated teachers and graduates of higher institutions of learning who should have known better.

The idea has somehow become fastened in the minds of teachers and people in the past that mental training of a child is all that is necessary, and that wonderful thing called Nature will look after the physical development. The idea has been to graduate him with a master's degree, and the schools have done a great thing. It matters not that the "educated one" is a "snaggled" tooth old man at twenty-five, wearing double lens glasses, and having incipient tuberculosis. In the opinion of the solemn professors, he is educated! As a matter of fact, such a student is only thirty-three and one-third per cent educated.

With a full realization of the defects in our State's educational system, a few men of vision succeeded in getting legislative action requiring each teacher in the public schools of the State to obtain certain information from the individual pupils and to record this information on physical examination cards prepared and supplied by the State Board of Health. This service is required at intervals of not less than three years.

This is known as the Medical Inspection of Schools Law. The purpose of this law is to teach applied health in the schools. This law presupposes as a matter of fact that a teacher should be as much interested in the physical and moral training of a pupil as in the purely mental. The law also takes it for granted that the high educational authorities, State Superintendent, State examiners and institute conductors and, most important of all, county superintendents of schools will expect and require teachers to be interested enough in this important phase of their duties to cooperate sympathetically and

successfully with the State Board of Health. North Carolina is one of the first States to contemplate and put into execution such a law requiring teachers to begin this work. Now the authorities of many other States are rapidly moving in like manner.

The sole purpose of the medical inspection of school children in North Carolina is to teach applied hygiene and health and to find defective children and have them treated. The absolute necessity for such efforts in a systematic manner has been long realized by wide-awake people. The officials of the State Board of Health, together with a few county health officers and leading citizens of the State, have been calling attention to these matters for many years. But it remained for the army draft to bring the majority of people to their senses. It is an established fact that more than a third of the nation's young men were found unfit for rigid military duty by ordinary draft boards. However, the most significant feature is that fifty-six per cent of such rejections were due to preventable defects if treated in time; such defects as decayed teeth in children, diseased throats, and other defects so common anybody could recognize.

If our State is to go forward and not backward, if our Nation is to be able to defend its homes and its people, then every citizen must help apply the remedy. Every teacher from the second grade teacher in the backwoods negro schoolhouse to the President of the University, must acknowledge and accept his or her individual responsibility. The State Board of Health working alone on this problem would be like a man trying to light a modern city with one lantern. On the other hand, a city or county trying to meet the difficulties single handed resembles the flicker of a candle in a three hundred room hotel. A State-wide system with active co-operation from teachers and authorities

in all the counties, cities and towns of the State is necessary. In a word, the whole aim and purpose of this undertaking is to conserve the health of every child in North Carolina. Can any teacher be asked to take part in a more inspiring enterprise?

Every teacher knows that when a pupil fails to make the normal advance from class to class that it oftens holds back the whole class and disorganizes and disrupts the school organization, increasing, too, the cost of education to all of the children of the community. What every teacher does not know, however, is that nearly half of such children fail to advance on account of preventable physical defects. Again, few teachers know which children to place on front seats in the schoolroom on account of slight defects of sight or hearing. No teacher ever knows this until a careful watch or whisper test is made by the teacher to test each child's hearing, and until a vision test with a Snellen's test card is made. Thousands of children each year who have defects of hearing or vision so slight as not to be detected by ordinary contact are allowed to occupy seats in the back of the schoolroom, and fail to see clearly anything on the blackboard or to hear half the teacher says. Such children are usually termed inattentive or careless. What an injustice! Another thing, few teachers know or realize that a child under twelve years of age can seldom be induced to confess a defect, especially in the presence of its schoolmates. As a consequence the teacher bungles on through the year with results unsatisfactory to teacher or patron.

In order to simplify the teachers' duties as much as possible, and to get as much information as may be available, the officials of the State Board of Health have adopted a form of card devised to record a great amount of information in little space. This card



was prepared after several years study of the subject of medical inspection of schools and after consultation with many officials in different branches of service, including the head of the medical inspection of schools department of the United States Public Health Service at Washington, who prepared the first outline of the card. A careful reading of the questions on this card serves to emphasize the fact that the questions are calculated to arouse and hold the child's interest in his own physical condition and the disease history of his family. The card is devised for use four separate years. The teacher who makes the first examination records the history part of the examination across the whole face of the upper half of one side of the card, the side to be filled by the teacher. At this time the first column which has to do with the child's physical condition is filled, leaving the remaining three columns for filling in other and later years.

In procuring the desired information from the child or the parent accurately, it may necessitate some effort on the part of the teacher; but the teacher should never lose sight of the fact that the prime object for doing this work is the same as justifies the existence of a department of medical inspection of schools in the State Board of Health, and that is to find defective children and have them treated and to convince parents and guardians of all the children in the State of the necessity for the correction of remedial physical defects as early as possible.

In order that the examination may be made as simple as possible for the teacher, a sample card is here printed with answers from an imaginary child, which will be found illustrative of actual conditions.

In proportion to the teacher's enthusiasm, interest, intelligence, care and sympathy will the child be benefited.

The State Board of Health is doing its utmost to carry the proper treatment to every defective child in the State, but without the concerted loyal assistance of the teachers and parents of the children, success is naturally impossible.

After the preliminary examinations have been made by the teachers for all the pupils of all the schools in a county or city, and after the representatives of the Board of Health have reexamined the children having the most pronounced common physical defects, as diseased throats, decayed teeth or defective vision or hearing, the teachers and parents naturally feel like asking "What is to be done about it?" In other words, after going to all the trouble and expense of making an examination most carefully, establishing a diagnosis and proving beyond doubt the need of treatment, is no systematic effort to be made by anybody to fill the prescription? In answer to this question, a brief description of the methods employed by the State Board of Health to get children treated may be considered necessary for each teacher to know.

In order to undertake the treatment of the two most common classes of defects, viz.: throat diseases and decayed teeth, the clinic method has been adopted. This is an old principle applied in a new way, on strictly modern sociological lines. A strong effort has been made to eliminate the hitherto objectionable methods prevailing in the past, such as a social or financial classification, which has served most effectively to drive away the people most important to reach.

Dental clinics are conducted by dentists employed for their whole time by the State Board of Health. Each one is equipped with a portable outfit, including chair, engine, and the necessary instruments and materials for doing the simpler forms of dental work. Thus the dentists are able to treat the children in remote sections that would be

# NORTH CAROLINA STATE BOARD OF HEALTH PHYSICAL EXAMINATION OF SCHOOL CHILDREN

(THIS SIDE TO BE FILLED IN BY THE TEACHER)

Name of school Rockford County Catawba Date May 3, 1920  
 Name of child Johan Daniels Sex Male Township Rockford  
 Color: White Colored \_\_\_\_\_ Date of birth: Month April day 24 year 1910  
 Name of parent/guardian Samuel Daniels Address: R. 2, P. O. Box 1, Rockford, Catawba Co.  
 Occupation Farmer Were father and mother related before marriage? No  
 Father living? Yes If dead, state year \_\_\_\_\_ Cause of death \_\_\_\_\_  
 Mother living? Yes If dead, state year \_\_\_\_\_ Cause of death \_\_\_\_\_  
 Number brothers living two Dead one Cause of death colitis  
 Number sisters living one Dead one Cause of death subacute  
 Age commenced school 6 Present grade 3 Grades repeated (number times) deceased grade one time  
 History of chicken pox yes Measles yes Mumps no Scarlet fever no Smallpox no Whooping cough yes  
 Vaccination (smallpox) yes Number times twice When last successful (year) 1919 Vaccination (typhoid) yes State year 1918

Date of Examination	May 3, 1920	19__	19__	19__
Height	5-2 ins.			
Weight	65 lbs.			
Chest expansion	3 inches			
Hearing (watch)	rt. 40 lt. 40	rt. lt.		
Vision (Snellen)	RV 40 LV 40	RV LV		
Vision with glasses	RV LV	RV LV		
Teeth, number defective	4			
Teeth, number missing	0			
Teeth, number fillings	none			
Use of toothbrush	yes			
Enlarged tonsils	yes			
Mouth breathings	yes			
Skin eruptions	none			
Pediculosis	yes			
Other defects	Cupped foot			

denied dental service otherwise almost entirely. Children from six to twelve years of age, inclusive, are treated. No frontal or gold work of any kind is done. The emphasis is placed on prophylaxis and filling the first permanent molar teeth with permanent fillings, extracting when necessary and teaching the children the importance of keeping their mouths clean. The success of the dental clinics depends in exact ratio on the amount of cooperation and assistance obtained from the school superintendents, teachers and patrons of the school. More than sixteen thousand children had permanent teeth saved during the year 1919 alone. But more than six hundred thousand North Carolina school children have teeth that need treatment in 1920.

The establishment and maintenance of tonsil and adenoid clinics has been a much more difficult undertaking. But after overcoming almost insurmountable difficulties, these clubs have been successfully conducted. At the conclusion of the follow-up work done in a county by the nurse sent by the State Board of Health, a tonsil clinic is arranged. This is absolutely necessary because records prove that under prevailing methods followed in the past, less than one per cent of children needing throat operations were ever carried to a specialist. So, a tonsil clinic is the only logical procedure. This is conducted by the nurse procuring the consent of the parent to have an operation done. The State Board of Health has an emergency hospital equipment consisting of cots, blankets, sheets, towels and other necessities for providing comfort for patients. This outfit is set up in any comfortable building, at the county seat generally, where heat, light, water, and a reasonable amount of privacy is available. A separate room is provided with operating table and the specialist brings such instruments as he is accustomed to use and about

twenty children a day are operated on. On the day of the clinic, each child is undressed and assigned his cot on arrival. A careful examination is made of the throat, heart, lungs, by the specialist or the physician who administers the anesthetic. A urinalysis is also made. After the operation the child is put back to bed and watched by the nurse until the following morning, when, if on examination there is no evidence of hemorrhage and if the child is all right in every particular, the parent is allowed to take the little patient home. Every safeguard is thrown about each child, and these clinics, besides being of wonderful educational value, have opened a door of opportunity to hundreds of children who would otherwise never have had a chance. In this matter also the degree of success attained depends on the assistance of the teachers, patrons, school superintendents, and most important of all, on the local health officers and physicians.

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## YOUR TEETH

By REA PROCTOR MCGEE, M.D., D.D.S., Pittsburgh, Pa., in *Oral Hygiene*

### FIRST STAGE OF DECAY OF THE TEETH

"If your knife and fork, spoon, plate, cup and saucer were left from one meal to another without thorough washing, you would change your boarding-house.

"But why be so particular about outside matters unless you thoroughly cleanse your own mouth after each meal?

"When food is allowed to pack between and around the teeth, caries, or decay, as it is commonly called, gets a good start. The packed food decomposes and ferments; this makes the bacteria happy so they all move in.

"As the bacteria get settled upon the enameled surface of the teeth, they cover themselves with a coating called a gelatinous plaque. Under this pro-



ective covering the bacteria grow unless they are removed by thorough cleansing.

"Decay of the teeth, caries, is a disease just the same as tuberculosis or measles is a disease. In this disease the hardest tissue in the body is attacked.

"The bacteria of decay are really tiny plants. They live and die as other plants do and when they die, they decompose and ferment, forming an acid. This acid, in its fresh state, will dissolve the enamel of the tooth, a very little at a time at first, but the further in the bacteria get, the more rapidly they work.

"The enamel of the teeth is not sensitive. It is composed entirely of the salts of lime, shaped into microscopic rods that are bound together by a natural cement. The rods all point toward the center, like the bricks in an arch.

"Enamel is the armor plate of a tooth; when the decay gets through the armor it reaches the ends of the tiny fibres from the nerve that radiates through the body of the tooth.

"It is here that you get that first sharp pain that tells you there is trouble ahead—trouble that only one person can stop. Don't delay—your teeth are too valuable!

#### SECOND STAGE OF DECAY OF THE TEETH

"When that sharp little pain warns you that another tooth is going, it always seems 'so sudden'—so unreasonably sudden! The enamel is not sensitive but the dentine that forms the body of the tooth, and fills all of the space between the enamel and the nerve, is full of thrills.

"Where the enamel and the dentine meet the tooth is more sensitive than at any other place except on the nerve (pulp). The teeth are particularly sensitive at the margin of the gum.

"As the little bacteria of decay get further into the dentine, they send

scouts out ahead along the fibres that extend from the nerve. That is why the dentist seems to do such a tremendous lot of drilling in a cavity. If he didn't go well beyond the farthest particle of decay his filling would be a failure.

"The decay spreads out underneath the enamel as the acid produced by the bacteria eats away the lime that forms the hard part of the tooth. This causes the cavity to be larger, usually, on the inside, than it is at the entrance.

"Food and mucus and a remarkable line of debris collect in the cavity. An ash-can has nothing on a hollow tooth. This mess decomposes and then the owner of the tooth wonders why his friends take a backward step when he talks to them.

"Even at this stage the tooth may be saved without the nerve being destroyed but it is rapidly getting to the point where long and patient treatment will be required to keep it where the Lord intended it should be.

"In the mouth there are more than two hundred different kinds of bacteria. Most of them thrive upon decaying food. In addition to the pain and destruction these cavities cause, they mix this poisonous mass with every bite of food and help wreck the delicate machinery of digestion."

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### HEALTH OF THE SCHOOL CHILD

See that your child receives plenty of fresh air and exercise. The body needs plenty of systematic exercise in the open air. A healthy body and a healthy brain go hand in hand, and one seldom finds one without the other. See that the child's sleeping-room is well ventilated, so that it will not be poisoned by foul air. A healthy start in life means health, wealth and happiness in later years. See that your child lacks none of these opportunities for development.

If the child is frail or does not learn readily, look for a cause. There are many minor ailments and defects the correction of which may mean the turning point in the life of your child. The best is none too good for him. See that no stone is left unturned in bringing the child to a healthy maturity, and you will be astonished at the results. Do not neglect the child if he seems stupid. That is the time he needs attention. Any child who is weak or does not learn readily should be taken to a competent physician, who can often find defects the correction of which will make the child strong and robust, both mentally and physically. — *Michigan Public Health Journal.*

## KEEP SYMPATHETIC WITH THE CHILDREN

The growth of antagonism is very insidious and subtle. Usually those who are gradually becoming antagonistic are for a long time unaware of the fact. It is not deliberate and from choice. It is like the insidious oncoming of a hidden malady. It often becomes patent to one's friends before it is realized by one's self.

In the home it sometimes manifests its destructive influence between husband and wife; often between one or both parents and a particular child. It is easy for a parent to fall into a habit of criticising and "nagging" a child. It is a matter of "Why did you put on or

not put on this or that garment?" "Why didn't you do so and so?" Or "For pity's sake don't associate with this or that boy or girl." How quickly the child recognizes and reacts against the unsympathetic, critical attitude of the parent! How easily he slips into an attitude of impatience and self-defense!

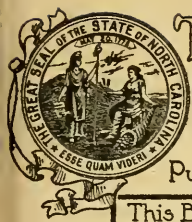
Then something infinitely precious has been lost to both parent and child—something that it is exceedingly difficult to regain or replace. The heart is like the leaves of the "sensitive plant." A touch may close it, though ever so light. After many such antagonistic touches it will no longer open the avenues of responsiveness so valued by the parent, so important for the future of the child.

These avenues have been closed to traffic—not deliberately, but none the less really and disastrously. Here is one of the great tragedies of the home.

The same tragedy is of frequent occurrence in the school. We want to warn the teacher of the direful influence and results of antagonism. We want to say, "Keep in sympathy with your pupils at all hazards and at any sacrifice. Make them feel your love and sympathy and understanding of their difficulties and problems. This will mean their redemption and your salvation as a teacher. You will be *the* teacher whom they will always remember and whose influence will abide with them through life."—*Education, quoted in Kansas Health Bulletin.*

Since beginning the clinic plan of treatment, in July, 1918, Dental Dispensaries have been held in thirty-nine counties and 33,003 school children have received free treatment.

Tonsil Clinics have been conducted in thirty-one counties and 1,964 school children have had tonsils and adenoids removed.



PREVENTABLE DISEASE NUMBER

# The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

This Bulletin will be sent free to any citizen of the State upon request.

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Published monthly at the office of the Secretary of the Board, Raleigh, N. C.

Vol. XXXV

OCTOBER, 1920

No. 10

## GOLDEN RULE BADGES

**MEASLES**  
IN QUARANTINE

TO TEAR DOWN or mutilate this placard in any way whatever before  
the consent of the County Quarantine Officer is a misdemeanor, and  
the offender shall be fined not less than \$50 nor more than \$100 or imprisoned not more than 30 days.

### SMALLPOX

NO QUARANTINE  
BE VACCINATED to Protect Yourself

TO TEAR DOWN or mutilate this placard in any way whatever before

### Diphtheria

IN QUARANTINE

TO TEAR

TO TEAR DOWN or mutilate this placard in any way whatever before  
the consent of the County Quarantine Officer is a misdemeanor, and  
the offender shall be fined not less than \$50 nor more than \$100 or imprisoned not more than 30 days.

way whatever before  
the consent of the County Quarantine Officer is a  
misdemeanor, and the offender shall be fined not less than \$50

**Scarlet Fever**  
IN QUARANTINE

TO TEAR DOWN or mutilate this placard in any way whatever before  
the consent of the County Quarantine Officer is a  
misdemeanor, and the offender shall be fined not less than \$50 nor more than \$100 or imprisoned not more than 30 days.

**Typhoid Fever**

TO TEAR DOWN or mutilate this placard in any way whatever  
before the consent of the County Quarantine Officer is a misdemeanor, and  
the offender shall be fined not less than \$50 nor more than \$100 or imprisoned not more than 30 days, as required by  
Section 11, Chapter 263, Public Laws 1917

**WHOOPING COUGH**  
IN QUARANTINE

TO TEAR DOWN or mutilate this placard in any way whatever before  
the consent of the County Quarantine Officer is a misdemeanor, and the offender shall be fined not less than \$50 nor more than \$100 or imprisoned not more than 30 days, as required by Section 11, Chapter 263, Public Laws 1917

A placard on a home tells a contagious disease exists there. Give your neighbor a square deal. You want one. Report the diseases at your home. Report promptly. You will prevent sickness and save lives.  
Follow the Golden Rule

THOUGHTS OF THE JOY OF LIVING INSPIRED THE IDEAS  
EXPRESSED IN THIS BULLETIN

Who is Responsible? See Page 12



# ACCOMPLISHMENT

Accepting the belief that one out of every ten who have typhoid fever die, there were 8,390 people sick with this disease in 1914 and 4,270 in 1919. Due to extensive free administration of the treatment preventing this disease and the sanitation throughout the State, in six years there has been a reduction of 50 per cent of the deaths and amount of sickness caused by typhoid. More striking is the comparison of the first nine months of 1920 as compared to 1919. Reports indicate that the results of typhoid campaigns in about 50 counties and installing of sanitary closets over the State, as required by law, has given 40 per cent fewer cases this year than last.

## RECOGNITION

The following is an editorial comment on the above:

North Carolina's investment in better health has paid better probably than anything else it has invested in. It is estimated that the saving as a result of the reduction in typhoid cases amounts to half a million dollars. But the money saving is not the best part. Think of the saving in anxiety in the home, in grief over the dead. The sum total of the State's happiness is vastly greater than it would be but for the reduction in the ravages of typhoid.—*News and Observer*.

J. S. M.

## HAS YOUR COUNTY HAD A TYPHOID CAMPAIGN WITHIN THREE YEARS?

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J. S. MITCHENER, M.D., State Epidemiologist.

# THE Health Bulletin

PUBLISHED BY THE NORTH CAROLINA STATE BOARD OF HEALTH



Vol. XXXV

OCTOBER, 1920

No. 10

## IS YOUR HOME BURGLAR PROOF?

Fresh air, personal hygiene, a balanced diet, a safe water supply, effectively screened doors and windows, a sanitary closet, smallpox vaccination, treatment to prevent typhoid, toxin-antitoxin to prevent diphtheria or the early administration of diphtheria antitoxin if you have this disease, proper feeding of infants and children, prompt reporting of preventable diseases to the Quarantine Officer, extra care of the patient and the discharges of the nose, throat, bowels and kidneys of the sick—all serve as bars for the windows and locks for the doors.

These are the things that will help make your house proof against the burglar death that so easily finds his way into your home, day and night, to steal life before FATE has cut the thread.

What is your town and your county doing to make your home and your community burglar proof? As a citizen, as a parent, as a unit of society are you hastening yourself and others to a premature grave or are you trying to defer old age?

J. S. M.

Danger zone! Mothers, you can't tell where the germs or poisons of contagious diseases are at work



## FOREWORD

The current issue of the HEALTH BULLETIN is devoted to topics of great interest and greater importance to our citizens. It deals with the essentials of a health department. It will give points worthy of note all along life's journey. It tells about the beginning of your day—that moment when the doctor exclaims "My! The finest child I ever saw." Then grandma clasp- ing her hands, bowing and smiling all over, adds, "Ain't it cute." Mother's request comes quickly after, "Let me see the darling." After this formal welcome, the child is introduced to the State Epidemiologist by silver nitrate being dropped in the eyes to prevent blindness.

The aim of this health official is to carry the child safely through the days of contagious diseases of childhood, to avoid death-dealing typhoid and ugly-faced smallpox and illness and death from any preventable disease. The Epidemiologist wants the healthy child now grown to sturdy manhood to live a long, healthy, and happy life and to pass through the tranquil days of a ripe old age—that gift to the old which the young desire to come slowly.

Thoughts of the joy of living prompted the expressions in this bulletin. From choice the articles are brief, hoping the reader will not tire before he gets the whole lesson. The most difficult task is to avoid the routine of health articles and bulletins; also, to be terse and to the point in presenting the subjects. The ideas come from our daily contact with the citizens of the State. Effort is made to tell them what it seems to us they wish to know. Those anxious for advice to prevent death give to us these thoughts, as the farmer sends his cotton to the manufacturer, who in turn sends back the finished cloth to protect the bodies of those producing the raw material.

It is hoped that this bulletin will be kindly received; that when you have read it you will hand it to another, and that it may be the means to the end of even one LONG, HAPPY, and HEALTHY LIFE.—J. S. M.

The place for "Every Woman's" children below school age is at home when measles and whooping cough are about



Keep your children under five away from other children. During these years death's toll is heavy

## HOW TO PREVENT DEATHS FROM DIPHTHERIA

The aim of the Bureau of Epidemiology this year is to markedly decrease deaths from DIPHTHERIA, TYPHOID FEVER and PELLAGRA. Sanitation and vaccination through cooperation of our citizens will make TYPHOID as scarce as "hen's teeth." The plan for prevention of PELLAGRA will be announced later.

In this article we will state briefly the means of preventing deaths from diphtheria and try to enlist the help of the parent, the physician, and the druggist, the three agencies in the accomplishment of this end. First, we explain the parent's part. We would like to see every parent have every child in North Carolina above six months of age protected by the toxin-antitoxin method. This will prevent the sickness with its financial cost, the mental anxiety it causes, the afflictions such as loss of voice and a weakened heart that this disease often leaves in those who recover from it, and above all, it will prevent the deaths. This toxin-antitoxin method is of great importance in children and babies, for during their ages we have most of the cases and most of the deaths. But if you do not take advantage of this method, we urge you to accept the following advice: When your child has sore throat, especially when you see white membrane or patches of white in the throat, or when the child is croupy, take no chances. You are not the doctor; call him. A dose of antitoxin is cheaper than a coffin, and a live child is a better memorial than a tombstone. There is more music in the laughter of a child than in a funeral dirge.

When your doctor comes, say to him "Mary has symptoms of sore throat or of croup. I have called you because the HEALTH BULLETIN of our State has converted me to prevention. Examine her well and if in doubt, give her anti-

toxin. Don't say anything about cost for the State taxpayers are making an antitoxin used in 80 per cent of the cases of diphtheria, with the best results, which is sold for less than the cost of production and sale."

Now comes the doctor's chance to help, for it is up to him to deliver the goods. We hope he will take no chances but give antitoxin in doubtful cases. By taking chances HE may lose the child and then to cover up his mistake, folding his hands piously say, "God hath taken it away."

The druggist may help by keeping the State Board of Health antitoxin. At first the business man did not like to keep our antitoxin because there was no profit. He wanted to make the public spend \$5.00 in order to clear a dollar himself. The druggist is changing. He was like some doctors were when we first began the treatment to prevent typhoid fever. Those doctors changed and now the druggist is seeing beyond the dollar in his hand today. Each profession realizes that it owes to its customers SERVICE. So let every one of you ask your druggist NOW if he has on hand North Carolina State Board of Health Diphtheria Antitoxin, and if he does not, tell him you are one of his customers and you feel that he should have it. Why send money out of the State for antitoxin? Keep your dollars at home and your babies out of the grave.

Early diagnosis and early administration of North Carolina Health Board Diphtheria Antitoxin will practically save digging all graves from diphtheria.

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## DOES DIPHTHERIA ANTITOXIN STAND THE TEST?

In North Carolina the evidence is limited by the recent establishment of our registration of deaths and our reports of sickness. However, the answer to the above question is becoming clear

"The Lord giveth," but careless, indifferent man helps rob the world of the fruit of life

as the data accumulates, as will be seen from the following:

Deaths from diphtheria in North Carolina and death rates per 100,000 of population in each year:

Year	Deaths	Rate per 100,000
1915	525	22.18
1916	418	17.4
1917	308	12.67
1918	252	10.2
1919	242	9.67

The records of cases and case fatalities (i.e. the per cent of those attacked by diphtheria who die) is indicated in the following table covering the years for which statistics are available:

Year	Cases	Deaths	Case Fatality
1918	1366	252	18.47%
1919	3519	242	6.88%

The factors in the marked reduction in deaths from diphtheria in North Carolina have been operating before 1915, when there were 525 deaths. There would have been more deaths had there not been antitoxin then. But the increased use of the product since the State has provided a first-class antitoxin practically free has made the further reduction possible. **DIPHTHERIA ANTITOXIN DOES STAND THE TEST.** It is a splendid weapon against diphtheria germs as a Baby Grave Digger. It cures after you have the disease if given early.

## THE DRUGGIST AND 25c. DIPHTHERIA ANTITOXIN

The following inquiry frequently finds its way to the State Epidemiologist:

Dear Dr. Mitchener:

My druggist charged me \$12.00 for the antitoxin used in treating my child. Was it too much? I did not think I should pay such a high price.

Very truly yours,

(Signed) Mrs. M.

This mother had heard of the North Carolina Health Board's Antitoxin which costs 25c.—your taxes paying the difference.

The following is the nature of the reply made:

Dear Mrs. M.:

There is only one condition under which I can say you were overcharged. If your druggist furnished you with antitoxin made by the Health Board's Laboratory, you paid too much. This sells for 25c.—taxes paying the difference. I am sure that no druggist would do such an act as this.

A word as to the commercial antitoxin is necessary. Your druggist has a legal right to charge you what he wishes, provided he does not come in the group of profiteers.

We are trying to awaken the moral side of that profession. We want them to see that they may save a life by supplying the 25c. antitoxin. The low cost will enable everyone to take antitoxin rather than run the risk.

May we add that your family doctor may secure this product from the State Laboratory of Hygiene at Raleigh, N. C. If the druggist will not keep it for him he should have a small supply at his office. It will keep in a cool place. Many doctors are doing this to save their patients' money.

Ask your doctor and your druggist to make sure that a supply of the North Carolina Health Board's Diphtheria Antitoxin is convenient.

Very truly yours,

(Signed) J. S. MITCHENER,  
State Epidemiologist.

## MR. DRUGGIST SOME REASONS WHY

1. It is SERVICE to your community.
2. It may SAVE THE LIFE of just one child. Do you love dollars better than children?

The person who prevents the spread of contagious diseases prevents sickness and likely saves a life

3. It is a RETURN COURTESY to your physician to supply it for him.

4. It shows your customers that you APPRECIATE their confidence.

5. It is GOOD ADVERTISEMENT. Prescriptions and supplies will be bought where 25c. antitoxin is sold.

6. "IT DOESN'T PAY to handle the commercial antitoxin because my customers know that the State furnishes it at far less than cost. They expect it. The confidence and trust of my people is worth lots more to me than the profit on antitoxin." This is the expression of one druggist.

## PREVENTION OF DIPHTHERIA WITH TOXIN-ANTITOXIN

By DR. R. M. ATWATER, *Consulting Epidemiologist*

### WHAT IS IT?

Trite, but true, "An ounce of prevention is worth many pounds of cure."

With all respect to the antitoxin treatment of diphtheria—and no one will question its tremendous value—antitoxin is applicable only to persons who have the disease or else are intimately exposed. The treatment provides a strong immunity, it is true, but the protection lasts at best only a few weeks. It wears off quickly, so that after a month or so the person treated will be as susceptible to diphtheria as ever before. Toxin-antitoxin, on the other hand, is a treatment which does not produce an immediate immunity as an antitoxin does, but, when the immunity to diphtheria does develop, it comes to stay, probably as long as the individual lives.

Now each method has its advantages. In a sudden outbreak of diphtheria the disease can be prevented to a large extent from occurring among those exposed by the use of antitoxin in prophylactic doses. But in the long run and in non-epidemic times, the disease can be forestalled effectively by using this toxin-antitoxin mixture.

The principle underlying these facts is simple. When a child has some problem in his school work done for him he soon forgets how it was done. If, on the other hand, the child sits down and by the sweat of his brow works out the answer to the problem, he will remem-

ber how it was done as long as he lives. Just so with immunity to diphtheria. If we give a child ready-made immunity in the form of horse serum antitoxin, we do the same thing as when we work the problem for the child. He soon loses the immunity we gave him. Giving toxin-antitoxin is much like the good and proved way of making the child work out his own problem—it takes longer, but it lasts.

For a long time we have known that horses could be rendered highly resistant to diphtheria in this very same way. They were so powerfully resistant that their serum could cure men with the disease. This is the way antitoxin for diphtheria is produced. Several years ago, however, we began to extend this knowledge and to apply it to mankind. So, even though in man it has been possible to follow persons immunized in this manner for only ten years, the evidence from immunity in animals makes it highly probable that the protection afforded is life-long.

### WHAT WILL IT DO?

Toxin-antitoxin, when given to children in three doses, will produce in these children a powerful, efficient and permanent immunity to diphtheria. They will probably be better protected than if they had had an attack of diphtheria itself. The treatment causes almost no discomfort to children under ten years of age. There are no open sores. The treatment consists in only a needle

He who cares for the sick only assists nature in her efforts to restore the victim to health



Hands are made to carry things with. They carry diseases as well as necessities

prick and a small amount of the toxin-antitoxin mixture under the skin.

Toxin-antitoxin is to diphtheria what vaccination is to smallpox, and what sanitation and the preventive treatment is to TYPHOID. Most adults are immune to diphtheria, though they may never have had the disease. Children usually take many years to acquire this resistance. The toxin-antitoxin treatment simply shortens the time necessary for this immunity to develop from many years to a few weeks. Its great advantage lies in the fact that the shortening of the time comes just when the danger is greatest—in the early years of life.

#### WHO SHOULD BE PROTECTED BY TOXIN-ANTITOXIN

Most all children who are susceptible to diphtheria should have the great advantage of this insurance against sickness and death from diphtheria. The child should be given three doses of the toxin-antitoxin mixture (1 c.c. each dose at five to ten days interval.) This will stimulate his body to become actively resistant to diphtheria. All children above six months are susceptible and should have the treatment.

Our citizens who are responsible for the lives and health of North Carolina children, whether in homes, schools, orphanages or other institutions, owe this matter serious thought and consideration. Diphtheria has wrought havoc in many such institutions. There were 242 deaths from diphtheria last year in North Carolina, of which a very large part were young children in whom the disease is particularly fatal. Here is a safe treatment which offers practically 100 per cent perfect protection.

The toxin-antitoxin treatment is endorsed and used by the most eminent medical authorities and has seen striking success where it has been consistently applied. This has been specially true of rigid tests made in New York where diphtheria has been almost unknown in schools where the treatment

was used, while all around in other schools the disease was taking its heavy toll.

The State Laboratory of Hygiene, at Raleigh will supply health officers and physicians of the State with the toxin-antitoxin mixture free of charge. Let's give diphtheria one of our most active baby grave diggers the knockout blow.

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#### DIPHTHERIA AND TYPHOID. LIKENESSES AND DIFFERENCES

In 1919 diphtheria killed 242. Typhoid fever did the same stunt to 427. No trial of these murderers has been held for they are innocent little things and the folks—those who died, their friends or relatives—are to blame. Like seed planted in fertile soil the germs will grow and like the grass and the weeds will sap and smother the life of fruit-bearing plants.

Now, why speak of typhoid and diphtheria in comparison? In the case of typhoid—within four years we have reduced the number of deaths about 50 per cent by VACCINATION and building SANITARY PRIVIES. This reduction has been along lines to prevent the disease, but after it is once contracted there is merely a chance whether you live or whether you die. We just have no treatment to control the duration of typhoid or to effect a definite cure as we have in some other diseases.

How different with diphtheria—its cause—its spread, and its prevention can be told to everyone, AND ONE BETTER—we have a product of medical science called DIPHTHERIA ANTITOXIN which when given at the EARLIEST possible moment after the disease has begun will limit the duration of serious sickness to a few hours and make life a practical certainty.

To enable every one to have antitoxin, to use EARLY, the TAXPAYERS of our State built a laboratory at Raleigh

Solomon would phone to find out how his sick friend is. Disease does not travel by telephone

for making this antitoxin to sell for 25 cents instead of \$5.00 a dose.

My! "WHAT A GRAND AND GLO-RIOUS FEELING" to live in a good old State like ours.

Assume no risks—in croupy conditions and sore throat call your doctor and request him to use, if in doubt, the State Health Board Antitoxin, which sells for 25 cents—your taxes pay the rest.

Then diphtheria will not be a Baby Grave Digger.

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## SEPARATING THE SHEEP FROM THE GOATS

From way down east comes a story with a moral that should be a lesson to every one in the State. From a health officer's point of view, the story is most convincing.

In May, 1919, the commissioners of a certain county, realizing the merits of the treatment preventing typhoid and seeing the need of such treatment from the number of cases reported to their health officer, deemed it becoming the wise men of the east to place these conflicting armies in battle in their county. A general was ordered from the State Board of Health to fight the typhoid fever enemy.

The scene changes. In a field of waving corn we see a man at work. With a firm tread and a light heart he strides along, the embodiment of health and happiness. He sings as he thinks of his wife and the children who are on their way to be protected from the enemy, typhoid. They are not as strong as he and may succumb, but as for him, he is never sick and cannot leave his work to take the treatment. He must toil for those he loves.

Again the time and scene changes. It is July, 1920, a year later, and the fields, once so rich with their abundant harvest now lie idle and neglected. We enter the house and the anxious faces

and tear-stained eyes of the mother and her children tell us that a great sorrow is upon the home. We look around and upon a bed in the far corner we see a form so gaunt and sunken from the ravages of disease as to be almost unrecognizable. Who is this man that has been stricken down by the arch enemy TYPHOID FEVER? Why did he not take the preventive treatment, you ask. He is none other than the sturdy farmer who so short a while ago we saw happy at work in the field. He thought he was too strong to ever have typhoid and he did not have time to take the treatment. He was too busy to take a few hours to insure himself against the disease, but now his farm must be neglected for weeks while he pays the penalty for lack of wisdom. A few minutes from his work a year ago would have prevented it all. He took a chance and lost.

Moral—When you have an opportunity to take the treatments to prevent typhoid fever, make use of it and when your three years of protection are up, take it again.

The same story often happens with smallpox. These diseases surely pick out those who have been unwise. They separate the sheep from the goats.

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## COLITIS, THE MASTER GRAVE DIGGER

Which is worse—to kill an infant with an overdose of paregoric or with an overdose of filth from another baby's napkin? In 1918 there were 1,914 deaths among children under two years of age from this filth-borne disease in North Carolina. Paregoric may have contributed to some, but this number is very small. It may seem out of place for the Bureau of Epidemiology to write of colitis or bloody-flux or baby-bowel trouble in its bulletin, but in June, 1920, an appeal came to us for help from a town having an epidemic where several

The best teacher instructs the children about their health. She develops the "student body" as well as the "student mind"

infants died of this disease in a few days.

Then, too, we are interested in this disease because by one simple improvement COLITIS, TYPHOID, HOOK-WORM, and other filth-borne diseases can be prevented from sending babies to their graves. That one thing is the use of a SANITARY CLOSET at every home. Besides human filth, there are other things to guard against. We must not forget the dirt in our milk which the careless milkman puts there because of dirty hands and the dirty cow. Then, too, Mr. Fly is a great carrier and must be kept out by screens. The cooling of milk and the use of only clean nipples and boiled bottles play an important part in the reduction of this disease.

So to do away with colitis BABY GRAVE DIGGER No. 1, we must (1) have sanitary closets; (2) have the dirty diapers covered to keep flies away from the filth which is heavily loaded with the poison causing sickness and death; (3) have clean milk from clean, healthy cows handled by clean, healthy people; (4) practice cleanliness with bottles, nipples, etc.

Then COLITIS will not be a BABY GRAVE DIGGER.

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## MEASLES AND ITS EVIL COMPANIONS

Some say there are two things you have to do. One is to die, the other to pay your taxes. There are people who add to this list that you have to have whooping cough and other diseases in childhood. Surely you have to die. A tramp pays no taxes. Careful mothers are showing the world that their children do not have to have measles, etc., at any rate until after they are five years old. At this age there are very few deaths from these diseases.

Measles alone is not dangerous. The company it keeps causes the trouble. If the sick room is not kept dark the eyes get inflamed and sensitive to light.

If one attempts to use his eyes before they have regained their strength there is danger of weak eyes for years. The middle ear often becomes inflamed, causing the child to have earache. If the ear is not properly treated an abscess may form which often bursts and runs. Do you know that many children are deaf because of this? Measles itself rarely kills but that bad companion, pneumonia, digs the graves. Measles is to blame for it causes the child to have pneumonia.

When you know measles, etc., are present in your community, keep your baby from other children. If during this time he has a cold, his eyes look red and watery, and he seems to have fever, be careful about exposure to bad weather, but be sure to have plenty of fresh air in the room. Signs of the rash will come. Your doctor will help you, but remember that CARE is the one important factor in treatment, and you, not the doctor, give that.

PUT THE CHILD TO BED EARLY ENOUGH AND KEEP HIM IN BED LONG ENOUGH AND YOU ARE DOING THE BEST TO SAVE HIS LIFE.

Remember that the three bad associates of measles—the inflamed eye, the inflamed ear, the inflamed lung—attack three important organs of man, the eye for seeing, the ear for hearing, and the lung for breathing. Do not forget that INTELLIGENT CARE will likely carry your child over the day when measles, whooping cough, etc., play such an important part in digging graves of babies.

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## WHOOPIING COUGH—ITS DEATH CLAIMING POWER

Whooping cough's one great part in the work of the world has been to dig the graves for countless thousands of babies. By referring to the table below the record of this disease in a city can be seen:

Contagious and venereal diseases attack every part of man.  
**BEWARE!**



Under 1 year old—1 in every 8 having whooping cough died.

From 1 to 2 years old—1 in every 10 having whooping cough died.

From 2 to 3 years old—1 in every 30 having whooping cough died.

From 3 to 4 years old—1 in every 50 having whooping cough died.

From 4 to 5 years old—1 in every 200 having whooping cough died.

From these facts it can be seen that whooping cough has a terribly severe mortality for children under three years. The older the child the better his chances for life if he gets whooping cough.

**BUT IT IS NOT NECESSARY FOR CHILDREN TO HAVE THIS DISEASE.** By quarantining the sick it is possible to keep many children from ever having to face the danger of death from whooping cough, measles, etc. Public opinion demanded the law which requires parents to report to the Health Officer cases of contagious diseases occurring in their families when no physician is called. This makes it possible to save many of the most valuable lives the community owns by safeguarding the well and protecting them from the sick.

A child coughs and it grows worse for ten days. You know it has not had whooping cough. It coughs in spells; its eyes water; its face flushes during the two or three attacks it has a day; and it vomits. Mother, your child has whooping cough. You can tell better about this than a doctor. You see all these things which tell what the disease is. The doctor sees only the child unless he happens to be present during an attack. Do not expect your doctor to tell you if your child has whooping cough. No examination will tell this every time.

When the above condition occurs at your home, inform your quarantine officer. Do not expose your children to bad weather, but give them fresh air. If

they have fever, if the attacks strain them, call your doctor—not an old negro woman.

Do your part, then whooping cough will dig fewer graves.

## NORTH CAROLINA'S ATTITUDE TOWARD SMALLPOX

"Eventually—why not now" is but one of the thousands of trade-marks used by manufacturers to identify their product from other companies. They are to protect the maker and the consumer from that great tendency of American salesmanship to offer the "just as good" article. Trade-marks tend to build up a spirit of avoiding substitution. "Let the Gold Dust twins do the work" makes the housewife think of Gold Dust on market days. She wants only Gold Dust, even though her results may be as good with any other preparation. The price paid in advertisements is the cost of educating the housewife to demand that article alone.

Why should not North Carolina adopt the same plan when it comes to offering means to her citizens to prevent a disease? Should she not have a trade-mark and make the public demand only that method when its claims have been proven? Why should the public want a substitute when it comes to health or sickness and to life or death? Is this not more important than a certain brand of washing powder?

The North Carolina State Board of Health offers definite protection against smallpox. The trade-mark adopted by the Board for its product is "VACCINATION ALONE PREVENTS SMALLPOX." This means of prevention has stood the tests of over a century. Vaccination has held up to its claims when all other trials have fallen short. This method was introduced when the death rate from smallpox was high. The benefits were so great that Dr. Jenner,

When science gives you an opportunity to prevent disease—take it

the discoverer, was awarded 28 diplomas, eight medals, and \$150,000 by governments and scientific societies.

Why does North Carolina not quarantine smallpox? (1) It is not effective. It gives a community a false sense of security. (2) The old pest house does not give the results looked for. Time has proven that. The cost is too high for the results obtained. The same money used in carrying out other methods bears better dividends. (3) Quarantine is only a sieve. It takes a dam to stop the flow of the smallest stream. (4) When science gives a means of sure protection the State desires to offer no substitute. The individual himself is responsible for himself. He must keep off the track along which rushes the powerful locomotive.

Why vaccinate for smallpox? VACCINATION ALONE PREVENTS SMALLPOX. A century has made this an undoubted truth. The North Carolina State Board of Health says "when investigation has caused an effective union of an idea and proof of its definiteness to prevent a disease, let no man put those so joined together aside." So the only means to prevent smallpox

offered by the Board is VACCINATION.

What is there against VACCINATION? Nothing as compared to the dangers of the disease. It is stated that smallpox is mild now. This may be so, but what made it mild—VACCINATION during the past century. We can never tell when a BLACK SHEEP will come along. Some say that smallpox does not kill like it used to. True, but this is the result of VACCINATION. There were nineteen deaths from smallpox in North Carolina the first four months of 1920. If we do not VACCINATE the clock will be turned back a century.

Every County Board of Health can make laws which will have every child vaccinated against smallpox before entering school. They should do it. Were this made effective in a few years we would have our number of cases of smallpox reduced to a minimum.

(If you are interested in smallpox, write the North Carolina State Board of Health, Bureau of Epidemiology, Raleigh, N. C., for special bulletin No. 202.)

## RESPONSIBILITY

Who is responsible for the 427 deaths from typhoid fever, 242 deaths from diphtheria, the nine deaths from smallpox, and the thousands of cases of sickness from these diseases in North Carolina during 1919?

Not the North Carolina State Board of Health. Smallpox vaccine and typhoid vaccine are furnished free. Diphtheria antitoxin is furnished through the doctors or druggists at 25 cents.

The parent, the health officer, or the doctor is responsible. In your county, in your home—who is responsible?

The first thing to do to start a child out in life is to drop silver nitrate in his eyes. Otherwise he may be blind

Ever think of what the treatment preventing typhoid and smallpox vaccination might mean to you?

## WHAT THE REPORT CARD DOES

### PHYSICIAN'S REPORT OF CONTAGIOUS DISEASES

Sections 7 and 11, chapter 263, Public Laws 1917, require that attending physicians report the information called for on this blank form regarding cases of whooping cough, measles, diphtheria, scarlet fever, smallpox, infantile paralysis, typhoid fever, typhus fever, Asiatic cholera, bubonic plague, yellow fever, cerebro-spinal meningitis, ophthalmia neonatorum, German measles, septic sore throat (epidemic tonsillitis), and chickenpox, within twenty-four hours after obtaining reasonable evidence for believing that a person is afflicted with one of the aforesaid diseases.

Date Feb. 4, 19 20  
Name of disease measles  
Name of sick person John Doe  
Address See - R. F. W. #1, N. C.  
School district Mass Hill  
Name of householder or parent Sam Doe  
Physician's signature A. C. Dunn, M. D.  
Physician's address Stokes, N. C.  
(The following supplementary information will be appreciated.)  
Date of first symptoms Feb. 2, 19 20  
Date of diagnosis Feb. 4, 19 20  
Date of physician's first visit Feb. 3, 19 20  
Age 3 Color White Sex Male  
Township Trent  
If typhoid, diphtheria, scarlet fever, septic sore throat, was patient or is any member of the family engaged in the production or handling of milk? \_\_\_\_\_

2-4784

1. It tells the name of the disease that the patient has. Then we know what we must fight.
2. The name of the child is proof that the physician has complied with the reporting law. If death occurs, the certificate bears the name and there should be a contagious disease report card on file to correspond with the cause or contributing cause of death if either be a reportable disease.
3. The address and name of the householder enables us to mail instructions and helps us to locate the home if a personal visit is necessary.
4. When diseases occur in a school district, the teacher must be notified. She is of great value in preventing epidemics.
5. The physician's name protects him. It shows that he reported his diagnosis.
6. Date of first symptoms is important in the study of the spread and source of the disease.
7. An early diagnosis and a prompt report enables the quarantine officer to immediately take steps to prevent the spread of the contagion in the family and the community.
8. Age, color, and sex help to identify the patient. They are beneficial in the study of age, sex and racial distribution of diseases.

Flies do not wash their feet. Keep them out



**DISEASE PREVENTION COMPANY (N. C.), Inc.**

**Incorporated by Parents, Physicians, and Druggists in the State  
of North Carolina**

**THE DOCTORS AGREE TO:**

1. Promptly send correct and complete reports of the following diseases to the County Quarantine Officer. The State Epidemiologist is then able to quickly send an ounce of prevention to the parent and community.

**List of Reportable Diseases**

Whooping cough	Septic Sore Throat
Measles	Smallpox
Diphtheria	Typhoid Fever
Scarlet Fever	Ophthalmia Neonatorum
Infantile Paralysis	Paratyphoid
Cerebro-spinal Meningitis	Trachoma
Chickenpox	Pellagra
German Measles	

Tuberculosis is to be reported to State Sanatorium, Sanatorium, N. C.  
Venereal Diseases are to be reported to Bureau of Venereal Diseases, State Board of Health, Raleigh, N. C.

2. Use silver nitrate drops in child's eyes after birth.
3. Thoroughly treat cases of sore eyes in the newborn.
4. Send to the local registrar within five days the child's first legal right—a complete birth certificate.
5. Protect children and babies above six months from diphtheria by toxin-antitoxin method.
6. Remember that vaccination alone prevents smallpox and the child should be vaccinated by all means before school age.
7. Urge sanitation and treatment to prevent typhoid.

**THE PARENTS AGREE TO:**

1. Report the reportable diseases in the home and in the community to the quarantine officer.
2. Obey the laws governing reportable diseases as far as possible. "Do unto others as you would have them do unto you."
3. Protect the family from smallpox by vaccination.
4. Protect the family from typhoid by sanitation and by the treatment preventing the disease.
5. Protect the children above six months of age from diphtheria by the toxin-antitoxin method.
6. In sore throat and croup take no chances. Put the responsibility upon the doctor. Call him and request early administration of diphtheria antitoxin.
7. Insist that the doctor promptly send birth certificate with name of child to local registrar.

**THE DRUGGISTS AGREE TO:**

1. Serve customers by keeping available to prevent deaths, North Carolina State Board of Health Diphtheria and Tetanus Antitoxin and Smallpox Vaccine.
2. Not to make Dad "cough up" five dollars for them to clear one on diphtheria antitoxin, but sell to the customer the State's efficient antitoxin which is used successfully treating 80 per cent of the cases. Let the kids have the five spot. They will spend it for nourishing ice cream and the druggist will get the money with a clear conscience.

The company's advisor and transfer agent is the North Carolina State Board of Health, Raleigh, N. C.

**EVERYBODY SAVE LIVES AND BANK DOLLARS**

**GOOD HEALTH IS PREFERRED STOCK WHICH PAYS 100% CASH  
DIVIDENDS EVERY TIME YOU BREATHE**

Died from poison. The death was preventable, as it was caused by  
either drugs or filth

A query: How many deaths have you caused by not covering up your cough and sneeze?

## **SIMPLE POINTS TO REMEMBER THAT WILL HELP SAVE OUR CHILDREN FROM THE BABY GRAVE DIGGERS**

Remember that smallpox can be entirely prevented, but only by one means—**VACCINATION**. Using quarantine as a means to check smallpox is like playing with matches in a powder house. Have the whole family—**young and old—vaccinated TODAY**.

Measles, diphtheria, and whooping cough cause many deaths among children each year. The younger the child, the greater the danger of his dying if he catches these diseases. It is foolhardy to willingly expose a child to one of these diseases because children **DO NOT** have to take them sometimes anyway. Keep them away from sick children.

Diphtheria can positively be cured if Antitoxin is given early enough. To make sure of giving it early, call your doctor at once when a child or an older person has a sore throat. Ask your druggist and doctor **NOW** if they carry in stock the State Board of Health Antitoxin for your protection when Diphtheria does come.

Remember that infant's bowel troubles (cholera infantum, summer complaint, colitis, etc.) are filth-borne diseases. Have a **SANITARY PRIVY** that is fly-tight, screen your house and kill the flies, provide clean milk and pure food and you will have gone a long way toward preventing such diseases.

Remember that the sore eyes of babies which cause so much life-long blindness can be prevented by the use at birth of the medicine furnished free by the State Board of Health to doctors and mid-wives. The use of these drops at birth is required by State law. Let's make sure that **EVERY** baby has the benefit of this protection.

Train the children **NEVER** to use a common drinking cup. Teach them how to prevent disease by careful disposal of the body wastes. Explain to them how necessary it is that they stay away from sick children to avoid disease.

Do your part to see that the Health Officer is notified of every case of contagious disease, whether a doctor is called or not.

**Realization of responsibility—My kingdom for my dead friends!**

# THE BABY GRAVE DIGGERS



## WHICH SPIRIT HAS YOURS ?

Public opinion by means of law and education may promote Sanitation, Pure Milk, etc., to the extent that children will be walled from the graves. Absence of such a spirit makes the road to the grave short and the journey easy to make.





The

TUBERCULOSIS NUMBER

# Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

This Bulletin will be sent free to any citizen of the State upon request.

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NOVEMBER, 1920

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## FREE PUBLIC HEALTH LITERATURE

The State Board of Health has a limited quantity of literature on health subjects for free distribution. If you are interested in one or more of the following subjects, or want same sent to a friend, write to the State Board of Health for free literature on that particular subject.

WHOOPIING-COUGH  
 HOOKWORM DISEASE  
 PUBLIC HEALTH LAWS  
 TUBERCULOSIS LAWS  
 TUBERCULOSIS  
 SCARLET FEVER  
 INFANTILE PARALYSIS  
 CARE OF THE BABY  
 FLY PLACARDS  
 TYPHOID PLACARDS  
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 DISPOSAL PLANTS  
 WATER SUPPLIES  
 EYES  
 FLIES  
 COLDS  
 TEETH  
 CANCER

MALARIA  
 SMALLPOX  
 ADENOIDS  
 MEASLES  
 GERMAN MEASLES  
 TYPHOID FEVER  
 DIPHTHERIA  
 PELLAGRA  
 CONSTIPATION  
 INDIGESTION

## GOOD BOOKS AND PAMPHLETS ON CHILD CARE

### MOTHERS

Why Not Make a Study of Your Profession?

#### *The Mother:*

The Prospective Mother  
 Prenatal Care

#### *The Baby:*

Infant Feeding  
 Care and Feeding of Children  
 Short Talks With Young Mothers  
 Care and Feeding of Infants and Children  
 How to Take Care of the Baby  
 Infant Care

#### *The Child:*

His Nature and Nurture  
 Dietary for Children  
 Food for Young Children  
 School Lunches  
 What to Feed the Children  
 Hygiene of the School Child  
 Child Care

#### *General:*

American Red Cross Text-book  
 Home Hygiene and Care of the Sick  
 Milk, the Indispensable Food for Children  
 Feeding the Family

The Bureau of Public Health Nursing and Infant Hygiene will furnish names of publishers of above upon request.

# THE Health Bulletin



PUBLISHED BY THE NORTH CAROLINA STATE BOARD OF HEALTH

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## A RECORD OF ACHIEVEMENT

Leprosy, smallpox, yellow fever, typhoid, these in turn have scourged the world, but they have been surely conquered by science.

Now tuberculosis must go. There can be no reprieve, no pardon.

Tuberculosis can be prevented and can be cured. But each individual must do a part if the fight against the White Plague is to be won.

In North Carolina it is a winning fight that is being made. The record is a splendid one, though there remains much to be done. Let the figures tell the story.

In 1915 tuberculosis in North Carolina killed 3,710 persons. In 1919, four years later, tuberculosis killed 3,005 persons. With a steadily increasing population the fatalities from this cause had been reduced in four years by a total of 705.

Every person in the State can assist in carrying on this winning fight against tuberculosis by purchasing Tuberculosis Christmas Seals. If they are not on sale in your community write to Dr. L. B. McBrayer, Secretary, Sanatorium, N. C.



# CLINICAL RESEARCH ON INFECTION IN THE TUBERCLE BACILLI

## Resume of Tuberculosis Survey of Silk Mill Village at W————, N. C., 1915

By DR. L. B. McBRAYER

### NUMBER OF DEATHS

Since the establishment of the silk mill, 20 years before survey was made, from which time the village dates its existence, there had been 142 deaths from the following causes:

Tuberculosis .....	92
Typhoid .....	6
diarrheal diseases.....	18
All other causes.....	26
	— 50
Total.....	142

So it will be seen that in round numbers two persons died from tuberculosis every time one person died from any other cause. Or we might look at it from the standpoint of the death rate per 100,000. The average death rate from tuberculosis per 100,000 people in the United States is 147. It has been higher than this figure in the last 20 years, and the death rate from tuberculosis is lower than that figure in North Carolina at this time. Then with 407 inhabitants multiplied by 20 years would equal 8,140 inhabitants for one year, and at a death rate from tuberculosis of 147 per 100,000 would entitle this village to 11.96 deaths from tuberculosis in 20 years. Let's call it 12. But instead of having 12 deaths from tuberculosis they had 92, which in round numbers is eight times as many deaths as the average death rate from tuberculosis throughout the United States. But it is known that the population did not average 407 for the 20 years, as there were no people living in the territory occupied by this village when the silk mill was first established. This was the first silk mill to be established in the south, and was considered

an experiment, and the few people who worked there lived for a considerable time anywhere in and around the town, wherever they could find houses. So that it would seem proper to assume that the population would not average for the 20 years more than one-half the present number, in which case they had 16 times as many deaths as the average death rate throughout the United States. Again an unfortunate ratio. Of the 407 population, 350 were white and 57 were colored. There were no deaths among the colored population from tuberculosis. It would not be improper to compute the death rate on the white population alone, in which case the rate would be higher, but God knows it is too high already, and we desist.

The investigation thus far seems to prove that this silk mill village was a hot-bed of tuberculosis, and that it is so appalling that something ought to be done about it. That is what the W—— people and the owners of the silk mill thought. Hence this survey. Of course if there had only been one and one-fifth deaths every two years, which is the average United States rate for that many people, it would have been taken as a matter of course. The people of North Carolina are too prone to take 3,000 deaths annually in North Carolina from tuberculosis as a matter of course.

### CONTACT INFECTION

A further investigation shows that there are in the village under consideration 99 families, in round numbers an average of four to each family. The 92 cases of tuberculosis have occurred in 25 families. This at first glance would seem to indicate there were four times as many families who had not had a

case of tuberculosis as those that had, or a ratio of 4 to 1. But this is not a correct ratio for the reason that we secured the names of every family that had resided in the silk mill village in the 20 years in which there had been a case of tuberculosis. We could not secure the name of every family that had resided in the village during the 20 years, but it is safe to assume that in this time as many families had lived there and moved away as are there at present. In which case there would have been 200 families and only 25 of them having had a case of tuberculosis, or a ratio of 8 to 1. It is entirely probable that the ratio is higher than this. And, too, it must not be forgotten that these people worked together in the same mill, attended church and Sunday school together in their village church and were all acquainted with each other and perhaps visited with each other quite generally.

We stated above that the tuberculosis was confined to 25 families, but the records show that it was confined to 15 family trees. A family tree is represented by the diagram marked "Exhibit B," on another page. The history of tuberculosis in this family is of sufficient importance to elaborate. We were unable to find out the cause of death of the husband of the first Mrs. D—, nor could we obtain information as to the cause of death of one daughter-in-law. The others are shown in the diagram and the history is as follows:

Mrs. D— had two sons; she also had tuberculosis. The two sons are married and have families. She lived with one son, 20 miles northwest of W— until three months before she died. He became infected, likewise his two boys. When he got too sick to make a living on the farm he moved to W— so that his boys could support him by working in the silk mill. He is dead; likewise his two boys, all of whom died of tuberculosis. When the above men-

tioned son moved to W— Mrs. D— went to M—, 10 miles southeast of W—, to live with her other son, where she lived three months, and died of tuberculosis. This son has a wife, a boy 15, a girl 2, and another girl 8 months old. In this short space of time she infected the whole family, unless it was her son. This is the history: Son died of dysentery four weeks after his mother arrived in the home; the two-year-old girl showed clinical symptoms of the disease at the age of 6, four years after the grandmother went to live with her, and this continued for nine years, and she died at the age of 15; the eight-months-old did not show any clinical symptoms until at the age of 12 years and 6 months. She died at the age of 14. The 15-year-old boy is now positive to the von Pirquet diagnostic test and has definite physical signs in his lungs, but no clinical symptoms and is at work in the mill; (now dead, 9-20-16); the widow is positive to the von Pirquet diagnostic test and has a cough—clinical tuberculosis. When this widow's husband died she moved to W— so that her children could support her by working in the silk mill, which the son continues to do. And five deaths and one case, with probability of another, is charged to the silk mill, while in reality they were caused by a fond mother who never saw the mill.

Another family tree shows 13 deaths, 3 active cases, and 5 positive to the von Pirquet test; total, 21. Tuberculosis was brought into one of the families causing 6 deaths, by a mother's son who had lived in another state and who came and visited with his uncle for more than a year, the first one to take it being the boy he chummed and slept with.

In the study we gave the von Pirquet test to 130 people, 70 or 53.8 per cent were positive. Of these 55 lived in or had lived in the same house with a case of tuberculosis; 9 lived next door, and

there was no history of exposure obtainable in 6.

Much more evidence could be submitted along this same line, would space permit. Let us say in closing the evidence on contact infection in this study that the sum total of the evidence showed that 80 per cent of all cases occurred in the same house with a case, and a large per cent of the remainder occurred next door, while there were no cases in 75 per cent or more of the families.

### DOES NOT PROVE 100 PER CENT INFECTION

Many of the students of scientific medicine doubt the statement made by high authorities that practically 100 per cent of the population of the United States is infected with tuberculosis. The statements on this 100 per cent infection were given greater credence because they were backed up by a goodly number of autopsies. But it is well to remember that these autopsies were done on paupers from the slums of Philadelphia, New York, and Paris, and could no more be indicative of the population in general than the deaths from diarrheal diseases in the slums of New York would be indicative of the deaths from the same diseases on Riverside Drive. So the von Pirquet test showing only 53.8 per cent positive in one-third of the people in a town where the death rate for the past 20 years had been 16 times as high as the average for the United States, would indicate that the 100 per cent infection claimed by a few pathologists and echoed by a great many other people at least needs further substantiation before we accept it as proved. It is worthy of note that 45.7 per cent of those positive to the von Pirquet test showed physical findings in the lungs or glands, or both. It is well to state here that the United States Public Health Service found in a study made in the rural districts of Wisconsin that 80 per cent of those liv-

ing in a house with an open case of tuberculosis were positive to the von Pirquet test, 50 per cent of those who lived next door were positive, while of those living farther away only 20 to 30 per cent were positive. Evidently further study on this so-called 100 per cent infection is needed.

### HOUSE INFECTION

It is difficult to convict a house of conveying the infection of tuberculosis from one person to another or *visa versa*. In this study it developed that a patient, male, sick with tuberculosis, lived in a house for more than one year, his sister was also ill with the same disease part of this time. The man died two weeks after moving out of the house. The house stood empty for one year, at which time a family of negroes, composed of two adults and six children, moved in and continued to live in the house to the time of this study, a period of 18 years. Not one of the family had ever been ill with anything that could be suspected of being tuberculosis, and each member of the family was in good health at this time. No attempt was made to fumigate, disinfect, or otherwise cleanse this house.

Another house in the village was similarly occupied by three persons ill with tuberculosis, all of whom died with the disease in the house. The house remained vacant one year and was then occupied by a white family, consisting of two adults and three children, and these continued to live in this house for a period of 17 years up to the time of this study. No effort had been made to fumigate, disinfect, or otherwise cleanse this house. No case of tuberculosis had occurred in this family and all were well at the time of this study.

This is about the only evidence on house infection noted in this study, and it is considered very, very flimsy, and is only submitted because it apparently is a straw which indicates the way the wind is blowing.



There were many other interesting things developed in this study. For example: Every person had his age, height, and weight recorded, from which it would be an easy matter to calculate the nutrition or malnutrition in each case examined. The haemoglobin index for each patient examined was recorded, but space forbids further mention of these and many other things.

It was our opinion, from these studies, that the silk mill per se was not responsible for the tuberculosis, but that it was a matter largely if not wholly of contact infection, and that all the original cases developed at some other place and moved into the silk mill village and of course continued to communicate the disease to those with whom they associated most closely, which in most instances were the members of their own family. This information seemed to lull to sleep the conscience of the people of W—— and nothing has been done about it so far as we know. While we do not consider that this study has proven anything beyond a reason of doubt, we do feel that

it has contributed valuable testimony on the following points:

1. House infection, that is, the house being the medium of transmitting the infection of tuberculosis from one person to another, is not probable.

2. The infection of tuberculosis is not transmitted by casual exposure, but per contra it requires prolonged exposure and massive doses of the tubercle bacillus to produce serious infection.

3. That 100 per cent infection with the tubercle bacillus is a myth, and that the probabilities are that the infection in the south, and particularly in North Carolina, is not likely more than 50 per cent and very probable much lower.

(My thanks are due Dr. P. P. McCain, Assistant Superintendent North Carolina Sanatorium and Chief of Medical Service, Dr. R. McBrayer, Clinician and Director of Laboratories North Carolina Sanatorium (at time an undergraduate), and Miss Grace McCubbins, R. N., who at the time was taking a postgraduate course in tuberculosis nursing at the Sanatorium and is now doing nursing as a missionary in China, for valuable aid in this study.)

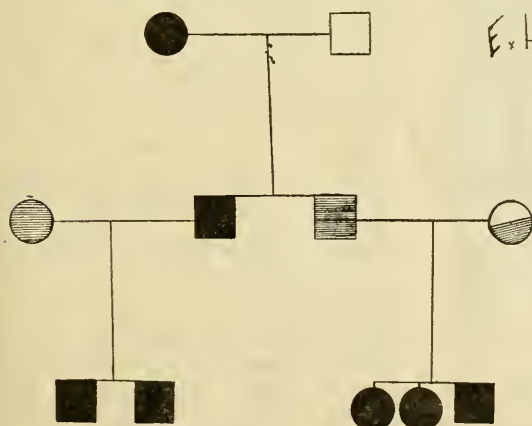
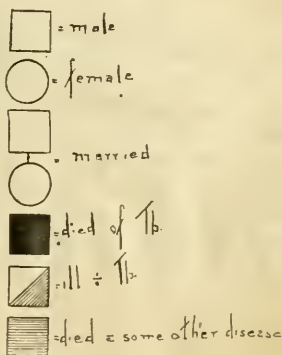


Exhibit B

Mrs D



## THE TUBERCULOSIS CLINIC AT SANATORIUM

It seems now to be pretty well known that the Sanatorium, by its medical staff, conducts a diagnostic clinic, which is open every day in the year, except Sunday, from 8:30 a.m. to 12 m. The only charge is that the patient's physician, or the patient desiring an examination, must write us and advise us of that desire and allow us to name the date on which the patient may come. We are examining about 1,000 patients per year in this clinic, and it will readily occur to you that were there no system at the clinic, that if anyone was allowed to come when one pleased, and they all decided to come on the same day, that the railroads would be considerably crowded, in fact, taxed far beyond their capacity, and the neighboring hotels likewise, not to mention the medical staff at the Sanatorium.

There are many encouraging things about this clinic—one is that the doctors are using it much more than they did five years ago. At that time about 66% to 75 per cent of the patients applying for examination came of their own accord, without the advice of their physician and occasionally contrary to the advice of their physician. One patient reported that her physician advised her not to go to the Sanatorium for examination. "You haven't tuberculosis, but if you go there they will tell you that you have it, for that is their business." But things are quite different now; 66% to 75 per cent of the patients who come to the clinic for diagnosis are sent by their physicians, which shows quite a different attitude.

Another encouraging thing: Five years ago there were very, very few people who came to the clinic that did not have tuberculosis and what was much more serious, many of them were far advanced cases and did not know that they had the disease. Now things are quite different. For September of

this year we examined 89 patients; 25 were patients returning for their periodic examination; 18 were positive cases and 46 were negative. These figures show that nearly three times as many people came for examination who were found NOT to have the disease as were found to have it. This means that the doctors are on the lookout for it, and are making the diagnosis themselves on the plain cases, as they ought to do, and are sending to us for the most part only the cases that are so early that they are doubtful about the diagnosis. This is as it should be. It also means that we are getting enough information to the people until they are on the lookout for the disease in its incipency and consult their physicians early. This is really the most important thing in the treatment of tuberculosis—finding it early, when it can be cured, and it is also worth much to a person to find out that he has the disease. Along the line of finding the cases early, it might not be out of place to say that every early stage case that has taken treatment at the Sanatorium in the last six years, who stayed long enough for us to pronounce them an "arrested case," is now alive and putting in full time at work. Pretty good record, don't you think, and a pretty good argument for finding the cases?

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## THE VALUE OF SANATORIUM TREATMENT FOR EARLY CASES OF TUBERCULOSIS

That Sanatorium treatment under proper medical supervision has proven of great benefit to a large number of patients is demonstrated by the annual report of the North Carolina Sanatorium showing the present physical condition of all patients discharged previous to June, 1919.

The report on 283 patients admitted to the institution with incipient tuber-

culosis shows that 279 were discharged improved in health, while only four failed to improve under treatment. Of the number that improved 34 made complete recovery; 122 were discharged with apparently arrested tuberculosis, while active tuberculosis of 65 patients became quiescent. That all of this group of patients did not make complete recovery is due to the short time under treatment. The best results cannot be obtained by a stay of less than six months. At present 216 of these patients are living and working, and in most instances earning more than they were before taking treatment. Forty-six are living, but not working, while only twelve have died during the six-year period that this report covers. This mortality rate is lower than obtained in persons not tuberculous.

Of the 537 patients admitted with moderately advanced tuberculosis 501 were discharged improved, while 36 failed to make improvement. Those that made improvement were classified on discharge as, arrested 13; apparently arrested 42; quiescent 271; improved 175. At the present time 227 of these patients are living and working, while 122 are living but not working. One hundred and seventy-nine have died.

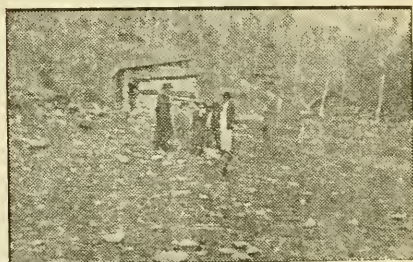
There were 337 far advanced cases treated. None of these could ever hope to be well again. The most that could be done was checking further spread of the disease. One hundred and eight were benefited by treatment, but 218 have died of tuberculosis. We have been unable to obtain report on 10.

This report brings out clearly two important factors in the successful treatment of tuberculosis. First, the importance of early diagnosis if the best results are to be obtained, and second, the necessity of continuing treatment until discharge is advised by the physician in charge. So many patients in sanatoriums, that have an excellent opportunity to become entirely well, make

the mistake of thinking they are as well as they feel and are thus apt to ignore the advice of the doctor and return home before the disease has become thoroughly arrested. It is very pleasing to the sanatorium doctor to see the rapid gain in weight made by the majority of patients, but it should be borne in mind that the general health improves a great deal faster than the lungs and great care should be taken to avoid over-exercise when you feel exuberant, as this is the time when the most good is obtained from treatment.

## THE TUBERCULOSIS CLINIC BROUGHT TO YOUR HOME

In order to afford an opportunity for free examination for tuberculosis to those that are unable to make the trip to Sanatorium, where free examinations are given every morning between the hours of eight and eleven a. m., or to a specialist in a distant city, the State Board of Health, the American Red



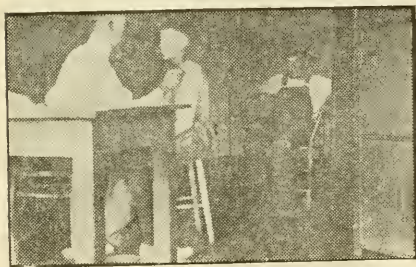
Home of Family in B..... County. Aid rendered by Public Health Nurse. Mother, Father and four children all ill with tuberculosis.

Cross, and the North Carolina Tuberculosis Association are coöperating by holding diagnostic clinics for tuberculosis at any point in North Carolina where six or more wishing an examination can be gathered. We will be glad to make examinations for both white and colored, giving as many days as may be necessary to each race.



It has been truthfully stated that tuberculosis is one of the most curable of all the chronic, communicable diseases, provided diagnosis is made in the early stages and proper treatment given under competent medical supervision. If you have tuberculosis do not be afraid to know it. It is your duty to know it. This knowledge is the only safeguard for the protection of your family and associates, and with proper treatment the only way in which your life can be saved. It has well been said that the next step in the fight against tuberculosis is *FINDING IT*, and that is the *why* of the Tuberculosis Clinic.

Do not wait until you are so ill with the disease that the layman can diagnose your trouble, as it will then be too late for you to become well again but seek the advice of an expert in tuberculosis if you have a rise of temperature in the afternoon, even though it is only a slight rise. A subnormal temperature in the morning, with a rise of temperature in the afternoon means tuberculosis ninety-nine times in one hundred, and often the other time, too.



At Work in the Clinic.

A cough that lasts more than two weeks should suggest tuberculosis and call for examination by a competent physician.

A low blood pressure, taken with the proper instrument, is suggestive of tuberculosis.

A hemorrhage from the lungs means tuberculosis without exception.

If you tire easily, have loss of appetite, night sweats, hoarseness, or any sickness that saps your strength that cannot be positively attributed to other diseases, be sure that you are thoroughly examined for tuberculosis. It may be the means of saving your life.

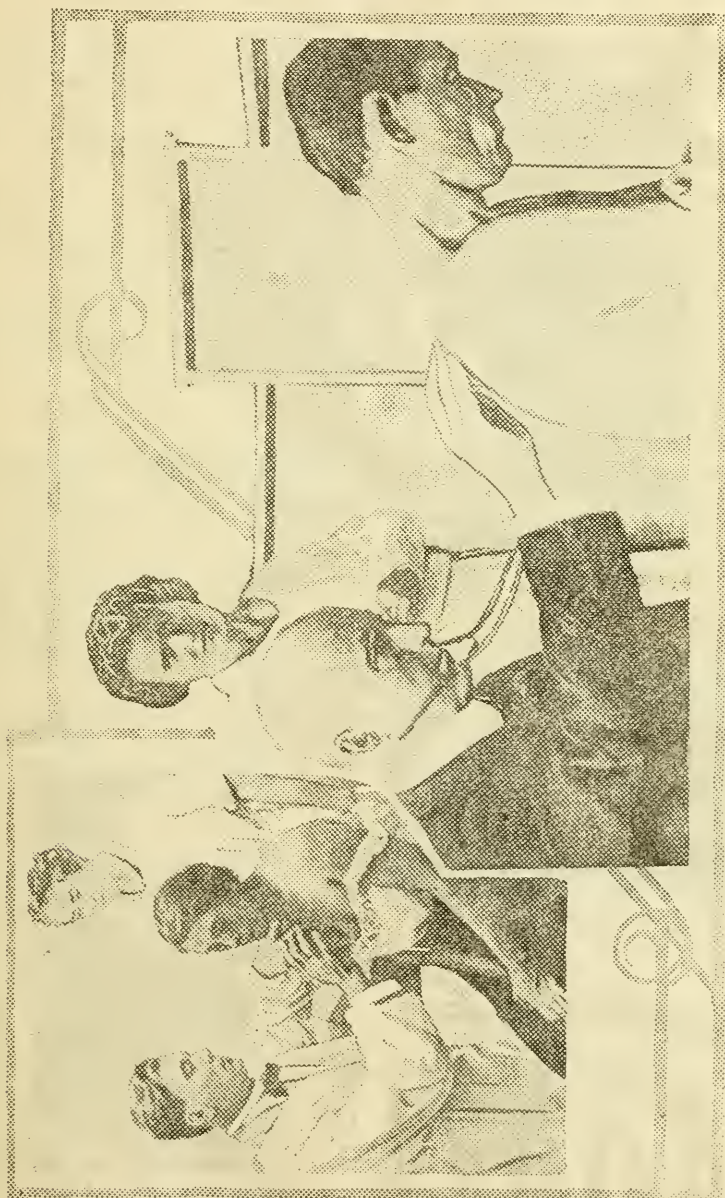
The North Carolina Tuberculosis Association has secured the service of Dr. J. L. Spruill, a competent diagnostician, who has for several years been closely associated with tuberculosis work in North Carolina, having been for three years clinician at the State Sanatorium. To aid Dr. Spruill the State Board of Health, through its bureau of Public Health Nursing and Infant Hygiene, furnishes an assistant—usually Miss Katherine Meyers, a registered nurse of considerable experience in public health nursing in the State.

The Association endeavors to conduct the clinic under the direction of the county or city health department. The health officer of the department is expected to arrange for the clinic by giving notice to the people that free examination may be had. Such notice to be given through the local papers, from the pulpits of the churches and at other public meetings, by moving pictures, lantern and slide lectures, distribution of literature and by word of mouth. The Association will furnish moving pictures, lantern and slides, posters, and literature on request. Where there is no health department, but a county nurse, she should make the necessary arrangements. Towns and counties having no health organization of any kind may secure a clinic through the physician, social workers, health department of the Woman's Club, or in some cases laymen will be found to make arrangements.

Those Public Health Nurses that have gotten to the work as outlined have done it well and the results have been splendid.

Evidence that the educational work in North Carolina is producing good results is seen by the steady reduction in the death rate from tuberculosis during the last six years.

In the clinics already held at eight points there have been 721 examinations made. Of this number 248 were found to have tuberculosis and each case advised regarding proper treatment. One



Proper Method of Making Physical Examination. It is necessary that patient be stripped to the waist.

hundred and seven showed suspicious symptoms, but had no definite clinical symptoms and further examination with the aid of the X-Ray and tuberculin tests were advised. Three hundred and forty-eight were found to be free of the disease.

The clinic physician made addresses on cause, symptoms, care and prevention of tuberculosis to 6,925 people while the clinics were being held.

With the aid of the public health nurses and other agencies we have secured the ordering of an election in Gaston County for the issuance of \$150,000 in bonds, to be used for the erection of a county tuberculosis hospital and tax for maintenance. During the clinic in Randolph County a meeting of the Board of Health was secured and steps taken to appoint a whole time health officer for the county.

The opening of the tuberculosis pavilion in connection with a general hospital in Burke County set in motion plans which we expect to result in an election for a tuberculosis hospital in Edgecombe County.



Physician, Nurse and Patient.

While the clinic was in progress in Edgecombe County 35 of the most prominent citizens met in the courthouse at Tarboro to discuss the question of a tuberculosis hospital for Edgecombe. A resolution was passed requesting Mayor Hardison and the chairman of the board of commissioners to appoint a committee to take the matter in charge.

During the clinic it was brought out very forcibly the certainty with which one active case of tuberculosis will infect a large number of other members of the family unless proper precautions are taken.

In Swain County a large number of physicians attended, bringing their patients with them. It was on account of this interest that a house was provided for the use of the public health nurse as a teaching center.

In Washington County credit is due the American Red Cross for raising funds of \$1,000 to provide a public health nurse for the county.

Other counties and corporations have under consideration the erection of a building at the State Sanatorium.

## TUBERCULOSIS PROGRAM FOR NORTH CAROLINA

1. (a) CLINICS. Unit of tuberculosis to be put on by health department, including clinics, the desideratum being a health department in every county and city.

NOTE: This works out by the health officer establishing a permanent tuberculosis clinic in the county town. This clinic should be opened at stated periods, every day or every other day or every other evening—7 to 10 or such times as will take proper care of all who apply or all who can be induced to apply for examination and treatment. In addition to the foregoing the health officer should hold a clinic in every township in the county at least four times during the year, the same being well advertised and well worked up by the public health nurse, when a public



health nurse is had. The public health nurse, who is a part of the whole-time health department, will coöperate with the health officer in every way possible, as more particularly outlined in article in this issue headed "The Tuberculosis Clinics."

- (b) In counties where there are no regular organized health departments, but a public health nurse, a unit of tuberculosis to be put on by the public health nurse, including clinics conducted by physician furnished by the State Sanatorium.
- (c) Where there is no organized health department, but a whole-time health officer, it is desired that the whole-time health officer put on the unit of tuberculosis; the Sanatorium and the Bureau of Public Health Nursing and Infant Hygiene coöperating in any way possible.
- (d) In counties where neither a, b, or c are functioning, clinics to be conducted by physician furnished by the Sanatorium, in coöperation with the county physician and the other physicians of the county; the Bureau of Public Health Nursing and Infant Hygiene lending such assistance as may be possible.
- (e) Continuing the diagnostic clinic at Sanatorium which has been conducted so successfully by the Sanatorium staff for the past four years. Doubtful cases found by physicians or doubtful cases found at clinics may be sent to the Sanatorium for study and diagnosis, after first having been given an engagement by the Superintendent.

(f) CONSULTATION SERVICE. In addition to the Sanatorium clinics, the Sanatorium offers a consultation service to physicians, where as many as six or more cases can be gotten together for examination.

(g) POSTGRADUATE SCHOOL OF TUBERCULOSIS AT SANATORIUM. The Sanatorium will continue its postgraduate course in tuberculosis for physicians. When the buildings under construction at this time shall have been completed it is hoped that the course can be given in a little more comfort and to better advantage. Physicians can only be admitted to this course in small groups. The Sanatorium will necessarily arrange the course as to time to conform as much as possible to their convenience. This course is open to regular licensed physicians in North Carolina. No charge is made.

(h) Training school for nurses will continue as now at the Sanatorium and a postgraduate school for training public health nurses or other graduate nurses in tuberculosis nursing will be conducted.

The outline of program mentioned in the foregoing has in mind coöperating with every department of the State, City, and County Boards of Health, the National, State, and County Tuberculosis Associations, the City and County health organizations of whatsoever kind, the Red Cross, the State and County Departments of Education, the State and County Superintendents of Public Welfare, Associated Charities, the United States Public Health Service,

and all other agencies of whatsoever name, without any overlapping.

2. **SANATORIA.** We agree with the National Tuberculosis Association and all other tuberculosis workers that proper sanatorium treatment is the best treatment that can be given a patient who has tuberculosis, from the standpoint of the patient, his family, and the community. We also agree with the National Tuberculosis Association and all other workers that in North Carolina there should be a minimum of one sanatorium bed for every death from tuberculosis annually. We had 3,391 deaths from tuberculosis in North Carolina in 1918 (latest figures available), therefore North Carolina should have 3,391 sanatorium beds.

We have at present one State Sanatorium for whites, with 200 beds, one county sanatorium for whites and negroes with 24 beds (Forsyth); one sanatorium supported by Tuberculosis Association, Red Cross, voluntary contributions, city and county, with 24 beds (Wilmington). Various private sanatoria at Asheville, Black Mountain, and Hendersonville, patronized largely by people from outside the State, but supposedly averaging 52 beds, used by North Carolina people. Total, 300. According to the rules of the game we then need 3,000 more sanatorium beds in our State. To supply this we recommend the following:

- (a) Enlargement and perfection of present State Sanatorium by State appropriation.
- (b) Expansion of present Sanatorium by counties building cottages at State Sanatorium, and providing for maintenance of patients under arrangements that can be made with the State Board of Health as now provided for by law. A building which has been recommended as a model has been erected, which accommodates 24 patients and cost, in 1917, \$12,000. It is supposed that this building can be built today for about \$25,000. It is of brick, with slate roof. The State Building Commission may require additional buildings to be fireproof.
- (c) **STATE SANATORIUM FOR NEGROES.** Early stage cases. The State owes it to both the whites and the negroes to take proper care of the tuberculous negro.
- (d) **COUNTY TUBERCULOSIS SANATORIA OR HOSPITALS—**For both whites and negroes, to care for advanced cases. This would work out by the large counties building and maintaining sanatoria or hospitals in size and proportion to their annual number of deaths, and the smaller counties grouping together for such purposes; always deducting the number of beds provided by said county at State Sanatorium. The largest number of annual deaths in any one county is slightly above 100 (Forsyth) and this county has already provided a county sanatorium with 24 beds.
3. **EDUCATION—**In every way possible, everybody possible, all the time possible.
4. The foregoing is submitted as an outline of what this Board considers a working plan for carrying out the policies of this Board as expressed in a paper

before the Medical Society of the State of North Carolina in 1917, the summary of which is as follows:

- (a) Every county should have a health department, consisting of a whole-time health officer, public health nurse, clerks, and other assistants.
- (b) Every person in the county who suspects or is suspected of having tuberculosis should have an examination free by the health officer, with consultation of Sanatorium expert or other expert when needed.
- (c) Every case of tuberculosis should be reported to the county health officer.
- (d) Every case of tuberculosis shall have proper treatment, (1) in a private sanatorium, (2) in a State sanatorium, (3) in a county sanatorium, (4) by family physician, or specialist, in own home, or (5) by county health officer in own home.
- (e) Every patient in the county who has tuberculosis should be carefully supervised by the health officer and the public health nurse, in order that he may have the best opportunity possible to recover, and that he

shall not communicate the disease to others.

Or, to express the gist of the whole paper in one sentence: Every person in North Carolina who has tuberculosis has a right to know it, to be properly treated for it, and to be so supervised that he will not communicate it to others.

NOTE: For the sake of clarity this Board desires to say that it is its opinion that where a county will only take up one item a county health department should come before a county sanatorium.

All of which is respectfully submitted to the people of North Carolina and their duly constituted officials.

NORTH CAROLINA STATE

BOARD OF HEALTH,

by W. S. Rankin,

State Health Officer.

Approved:

The State Tuberculosis Association desires to give to the foregoing program and policies its hearty approval, and to state that it will continue to give to the State Board of Health its moral, financial and organizational support in the furtherance of the same.

NORTH CAROLINA

TUBERCULOSIS ASSOCIATION,

By Mrs. Gordon M. Finger,

June, 1920.

President.

## FREE LITERATURE

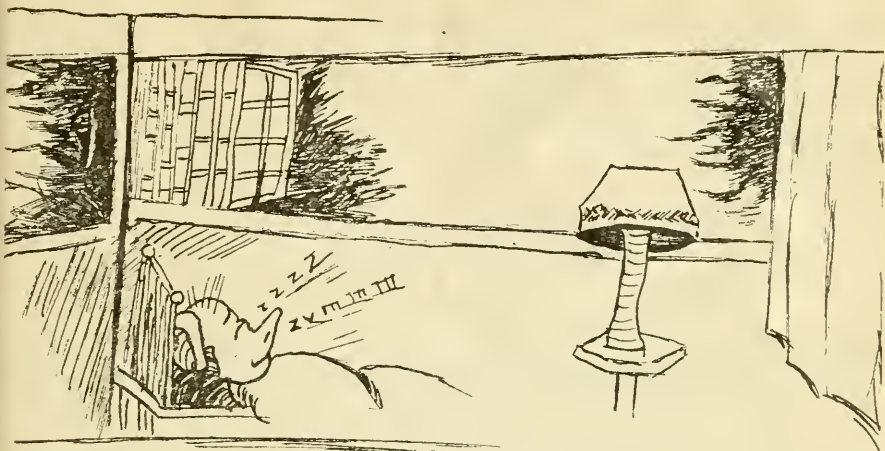
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Special bulletins prepared by the State Board of Health upon Tuberculosis will be sent without charge upon request to the Bureau of Tuberculosis, Sanatorium, N. C.





Et folks was es frantic 'bout  
Keepin' well es they be 'bout  
gettin' well there wouldnt be so  
much siekness.



rest - fresh air



nourishing food



proper medical attention will cure tuberculosis.

## A GREAT OPPORTUNITY FOR SCIENTIFIC MEDICINE AT TUBERCULOSIS SANATORIUMS, AND AN OPPORTUNITY TOO OFTEN NEGLECTED

Those doctors who have been connected officially with tuberculosis sanatoriums know how easy it is to let the medical work get in a rut. In fact it is generally understood, both by doctors and patients that it is the thing to do to make a physical examination of the chest, make rounds once or twice a day, or every other day, as may be the routine in a given sanatorium, etc., etc., etc., but the patients have not generally been given to understand that they may also have other diseases, such as malaria, syphilis, hookworm (10 per cent of the patients at the North Carolina Sanatorium are found infected with hookworm) tuberculosis of the intestines, diseases of the kidney, thyroid, adrenals, etc., etc. In fact more than one patient at the North Carolina Sanatorium has at first refused to allow a functional test of his kidneys to be made because he had never heard of it before. Certainly a patient at a sanatorium is not getting what is coming to him unless he is carefully studied from head to feet, and every defect or disease found and properly treated. For reasons of apparent failure of the medical staffs of tuberculosis sanatoriums to measure up to their full duty as above referred to, see last paragraph of this article.

That there is great need for research work in the field of tuberculosis is generally admitted both by the physician and laity. That we need a cure for tuberculosis like we have for diphtheria, a medicine, or serum or vaccine or other thing, which given the patient in one or a few doses will cure, is answered by asking the question. It would be glorious if we had a test that would tell us

whether or not the patient was susceptible to tuberculosis, as we have in the Schick Test in diphtheria. And then if we had a serum or vaccine or other medicine that would make the susceptible unsusceptible (called immune) the world would be able to start on a new era of progress and prosperity—for we would save enough money in one year were these things a fact to pay the entire cost of the war, and in another year we would save enough money to pay off all the bonded indebtedness of all the states, cities, and counties in the United States. And the third year, and every year after that we would save thirty million dollars in North Carolina and we could build all the hard surfaced roads that the *Greensboro News* and Colonel Kirkpatrick and everybody else wants, and we could enlarge our University and colleges for women and our insane asylums and school for feeble-minded, Jackson Training School, etc., and we might find both time and money to spend on the prevention of feeble-mindedness, insanity, delinquency, etc. It might be appropriate here to say that there is a saving to North Carolina this year, caused by the decreased number of deaths from tuberculosis and fewer people sick with tuberculosis compared with 1913, of eighteen million dollars, and this with our present methods which are admittedly imperfect. 'No, the writer is not over enthusiastic, nor is he beside himself, nor is the illustration overdrawn. Then it is apparent that if we were to spend one thousand dollars in the fight against tuberculosis every time we are spending one dollar, and continue this for an hundred years, and at the end of that time the knowledge above referred to was gained it would be the most productive investment the world has ever made.

Then we all admit that research work in tuberculosis is badly needed and has to this date brought a splendid interest on the money spent. But how will we go about it? Some one says, "Oh! let



the United States Government do it, through its Public Health Service, or let the Rockefeller Foundation do it. Oh, well; yes, it ought to be done, but we will let George do it." And that is the attitude of most people, and I blush to say it, but it is the attitude of many sanatoriums.

I tell you that every sanatorium ought to be doing research work. I tell you

that there is much research work in tuberculosis that can be done in no other place, and why isn't it being done? Not for lack of desire or ability on the part of the medical profession devoting itself to tuberculosis work. No, they are not only willing, but anxious and competent. The reason is that sufficient personnel in the medical staff and sufficient equipment is not provided.

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## NURSING A DESIRABLE VOCATION FOR TUBERCULOUS WOMEN

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By MARTIN F. SLOAN,

*Medical Superintendent, Eudowood Sanatorium, Towson, Md., in "Spunk."*

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(Adapted by L. B. McBrayer, Supt. N. C. Sanatorium)

Beneath the surface of conscious thought of the sanatorium patient, lurks the question, "Am I going to get well?" As reassuring and optimistic as the doctor may be this omnipresent and submerged thought occasionally crops out, preferably in the wee small hours, to inject an element of personal doubt in the matter. As evidences of returning health appear, such as cessation of symptoms and an ability to exercise without fatigue, and the "curing days" seem drawing to an end, confidence returns and the question of doubt gives way to the insidious reassurance, "I am going to get well." This is the time to plan for readjustment of the patient's life to one thoroughly compatible with the health regained that the good results of the long sanatorium days may not be nullified, and to one that will be useful and commended by society.

The awakening of both the social and business conscience which came with the great war broke down completely the barriers which formerly excluded women from participating in spheres of activity long allotted to men. Brave women in instances had dared to lose

caste by squeezing into these exclusive fields and succeeded in making their influence felt in commercial, industrial and professional life. The climax seems to have come now by the active entrance of women into the field of politics long monopolized by men.

Many young women who have had tuberculosis have had denied to them various of the newer vocations and most of the old. The spirit truly is willing but the flesh will not stand the physical strain. The intellectually qualified must deny themselves the privileges of the office, the schoolroom and the studio. The less qualified must forego the advantages of positions requiring brain matter indeed, but more skill and physical endurance. The very position which she may most desire possibly is denied her, because of the incompatibility of her health with its hours, fatigue and unsuitable hygiene. There is another factor which closes the door of many vocations to her and that is phthisiophobia or the fear of tuberculosis by the people. One of the rough places of our anti-tuberculosis campaign that remains to be smoothed over is the edu-

cation of the public to realize that contracting tuberculosis by the adult depends as much upon the physical vigor and strength of the one infected as upon the strength and vigor of the germs which come to him, and results only after health is broken by great strains on the body. Students of the disease look askance upon the history of a person who is said to have contracted tuberculosis from an office associate. However, the belief in rapid infection by the tubercle bacillus and consequent disease is general among the laity and the exclusion of tuberculous individuals is definite in many offices.

To those young women whose indomitable will and ambition refuse to yield to such a physical handicap as arrested pulmonary tuberculosis, I would call attention to an opportunity open to them and one which offers far more advantages than any other under the circumstances, and that is nursing, and in their particular case the nursing of the tuberculous. This is a vocation or profession which fulfills all the requirements of an ideal position; namely, adequate compensation, independence and retention of pride; it affords a life under the most hygienic surroundings and incorporates the opportunity for service to humanity.

In the training schools of those sanatoriums which maintain them there were graduated this year less than 200 nurses trained especially in the science of nursing patients with tuberculosis. Relatively few of the sanatoriums of the country have seen fit, for reasons best known to them, to organize training schools. Those who have, require that their candidates have arrested pulmonary tuberculosis. This is for altruistic as well as selfish reasons. It is altruistic because tuberculous women cannot always return to their former positions or accept a new one because either of their predisposition or that they are not wanted there. Further-

more, as one of the prime duties of a sanatorium is to restore working capacity and provide employment for its patients, it is inconsistent as well as unjust to train and employ physically normal young women in a nursing capacity. It is the privilege, therefore, as well as the duty of all sanatoriums to employ in so far as they are available only those nurses who have latent or quiescent pulmonary tuberculosis. The selfish motive is obvious when it is known that "arrested" patients make better nurses than healthy women. Endowed with sanatorium tradition they are enthusiastic in the work and are devoid of the uncanny fear of tuberculosis that many times dominates the attitude of the general trained nurse employed in a sanatorium. They realize they are overcoming a handicap and every day brings them nearer to their victory over sickness and are preparing themselves for a career consistent with their longevity. Without belittling the hundreds of faithful and brave women who have gone into sanatoriums to nurse against the advice and tears of their family and friends, sanatorium directors agree that the type of general trained nurse available for bedside or ward work is inferior to the patient-nurse.

Tuberculosis experts agree that the most difficult time in the treatment of tuberculosis today is the time after the patient leaves the sanatorium and is able to begin light work for a part of the day, but "feels as able to work as ever in his or her life," and alas too often disregards the advice of his physician and acts according to his "feelings," with disastrous results. The ideal treatment for a patient is to remain forever under his physician and work or rest or play under his direction. Particularly is this important during the "hardening up" process covering the first year or two years after the completion of sanatorium treatment. The pupil nurse who takes her

training in a sanatorium for the treatment of tuberculosis has these ideal conditions during her hardening up process.

The curriculum of the sanatorium training school is comprehensive and adequate. It consists of didactic lectures in fundamental medical subjects, such as materia medica, therapeutics, chemistry, anatomy, physiology, hygiene, sanitation, laboratory and microscopical technique, dietetics, practical nursing, demonstrations and bedside training. The course consists of two years, including two months probation, with two weeks vacation each summer. There is day and night duty of eight hours out of the twenty-four and time for recreation is given each week. During the training a small compensation is given, sufficient for incidental expenses. Most schools furnish books, but pupils are required to furnish their uniforms. The work though at times hard is nearly always congenial, and when the great advantages accruing are considered it becomes highly interesting.

After the day's work is over, ample opportunity is given to enjoy the outdoor life in the sanatorium grounds, and the pupils sleep in the open. Evidences of a physical break-down are detected early and relief instituted immediately. Such a procedure is not always possible in business life and valuable time consequently is frequently lost to the convalescent.

It often has been demonstrated that young women who enter the training school with a more or less doubtful physical outlook, under the daily routine of work and restrictions of exercise while off duty, finish in a better condition than was thought possible in the beginning. The writer on occasions, at the school with which he is connected, has felt it his duty to advise probationers to relinquish their training because of apparent poor health, but influenced by circumstances he pursued

a policy of watchful waiting. He<sup>e</sup> has been surprised to see several improve faster than they had ever promised to do while patients. The regulated exercise, the occupied mind and the well defined goal in view, produced a psychological and physical effect that was not obtainable with the patient lying around in bed or on a recliner, with no occupation but thoughts of her own illness and no object in view but to get out of the sanatorium as soon as possible.

The salary, though nominal during training expands into a larger one upon graduation. The demand far exceeds the supply of graduates. Graduates in sanatoriums receive from \$60.00 to \$80.00 per month with maintenance for ward work, and much more for positions with responsibility, and in private homes they receive from \$25.00 to \$35.00 per week with maintenance.

The demand for nurses in North Carolina who have had thorough training in nursing the tuberculous is great, and is increasing much more rapidly than the supply. It is no unusual occurrence to hear someone who is competent to judge say that for nursing the tuberculous, either in a sanatorium or elsewhere, a nurse having had the two-years course in a training school for nurses is much more desirable than a nurse who has had three years training in a general hospital. And this is not surprising, for the nurse trained in a general hospital has never been taught how to nurse and teach and care for a patient suffering with tuberculosis, though this should not obtain. The Surgeon General, U. S. A., has considered this subject of sufficient importance to issue a statement advising that all general hospitals have connected a tuberculosis department for the benefit of the patients, the nurses, and the community. A few of the more important hospitals require their pupil-nurses to take three of four months in a sanatorium for the treat-



ment of tuberculosis as a part of their three years course, among those we might mention the Cincinnati General Hospital, the Louisville City Hospital, and a few others, but these exceptions only serve to prove the rule. A serious defect in the training of public health nurses today is the lack of knowledge in the intricacies of handling, teaching and nursing the tuberculous. And this lack is recognized by the Red Cross, by State Boards of Health and all concerned.

Some schools are affiliated with general hospitals where a six months' post-graduate course is given to broaden out somewhat the practical training of the sanatorium. Some are even affiliated with general hospitals where their graduates can take an amount of extra training, sufficient to make them eligible for the degree of registered nurse. This is an opportunity for those who become wholly well in training and desire to broaden their profession to the fullest extent. The writer, however, advises patient-nurses to adhere to the sanatorium or certainly to the nursing of the tuberculous and not to be lured away by the broader field of the general hospital, wherein may lie the pitfalls to her health.

To those young women who have been told that their tuberculosis is arrested and who are judged suitable by their physicians, but who have been advised against returning to their former vocations where competition with healthy women is keen and debilitating, I would strongly advise a careful investigation of the advantages of a nursing career. The demand for nurses for the tuberculous is great. The salary is comparable to that of other positions or professions; the life is compatible with health and conducive to longevity, and the opportunity afforded to render service to others is seldom seen in any other vocation.

## THE TUBERCULOSIS WORK AMONG THE NEGROES IN NORTH CAROLINA

Active definite work was begun in the latter part of 1917 by the employment of Mrs. F. C. Williams, an intelligent and educated colored woman, as state director of Health Education and Organization. She had held a position as rural supervisor of colored schools and hence was acquainted with the negro teachers and their work—she had made good in her former position, and has made good in this work. We were fortunate to elicit the interest of Professor N. C. Newbold, Director of Rural Education for the negroes, and he made it possible for us to secure the coöperation of the rural supervisors of colored schools. The first eighteen months were devoted to the organization of the Negro Community Leagues; these leagues to study tuberculosis and other health subjects, and put into practice the things learned, etc.—this part of the work was thought to be successful.

In 1919 we decided to ask the negroes to sell Tuberculosis Christmas Seals—after advising with the leading negroes over the State. It was decided to make the rural supervisor director for the county, and she was to use the Community Leagues and her teachers to put on the sale. Mrs. F. C. Williams was field director of the sale among the negroes, and had a personal conference with every supervisor, usually having several supervisors meet her at a convenient point for a day's conference. We also made an allotment to each supervisor or each county—the allotment totalling 10,000 for 36 counties. We actually sold \$5,132.48. All of the money was sent in to the treasurer of the State Association and we promised if they would reach their allotment we would furnish a moving picture show for one week in each county for those participating and reaching their allot-

ment. Only *six* counties reached their allotment, but we gave them their movie, which will be referred to later.

### THE HEALTH CRUSADE

When the Christmas Seal sale was over we put on the Health Crusade in the same general way. Mrs. F. C. Williams, acting as field director, holding her group meetings with the supervisors, etc. There were 12,700 colored children doing the Health Chores during the months of January, February, and March of 1920, though we did not start the Health Crusade campaign until January, for the reason that we did not want to give the negroes two things to do at the same time until they became familiar with the work. But this year we expect to start our Health Crusade by November first. Mrs. Williams will go over both the Seal sale and the Crusade work in her group meetings during the month of October.

### TEACHING THE PREVENTION OF DISEASE IN THE SUMMER SCHOOLS FOR NEGROES

Nineteen and twenty is the third summer that this has been done and the idea is considered practicable and the work satisfactory. But we feel quite sure that the work has been better done this year than at any time before—Mrs. Williams has done this work and done it well. The summer just past she has visited every summer school and almost every teacher's institute, and through the kindness of Dr. E. C. Brooks, State Superintendent of Public Instruction, Professor N. C. Newbold, and L. C. Brogden, Directors of Rural Education, she has had her place on the faculty at each place. She presents the matter very forcefully. First she takes up the school law and turns to the page and paragraph requiring teachers to teach physiology and the prevention of disease, and in a certain part of the paragraph and later in the suggested daily schedule, she shows them that this

teaching is required by the State law, and the day of the week and the hour of the day on which it should be taught. She then takes up the bulletin prepared by the State Board of Health for teachers' summer schools and runs through it, dealing at length with the subject of tuberculosis. She then devotes considerable time to the Health Crusader, showing them how to go about it, its value, etc. In like manner she takes up the Tuberculosis Christmas Seal, the Community League, etc. During her stay at each summer school she gives an illustrated lecture on tuberculosis, advising teachers that they can borrow a lantern and slides for use in their community from the State Tuberculosis Association, Sanatorium, N. C., or the State Board of Health (same address). Mrs. F. C. Williams and the supervisors have given health lectures to 258,773 people during the fiscal year ending July 31, 1920. The same workers have given lantern slide exhibition to 14,700 people during the same period.

The correspondence in regard to both Mrs. Williams and the moving picture car, as well as all literature mailed out is handled through the office of the North Carolina Tuberculosis Association and the Bureau of Tuberculosis of the State Board of Health at Sanatorium.

### THE MOVING PICTURE CAR FOR NEGROES

Following up our promise we started our moving picture car March, 1920. The itinerary contemplates spending one week in a county and giving six to ten shows in each county. We were fortunate in securing Dr. E. T. Ransom, of Oxford, N. C., as director and operator of the car. Dr. Ransom is not only well fitted for the work by education and experience, but he is deeply interested in his people. He lectures and explains the pictures as they are shown, and thus makes them more understandable and profitable. He also visits as





tions of their homes, and in the prevention of the spread of disease.

The State Board of Health, in regular session, recommended to the General Assembly that it provide a state sanatorium for negroes. Governor Bickett, in his Emancipation Day address to a large assembly of negroes at Raleigh, January 1, 1920, stated that he would use his influence to provide a state sanatorium for negroes. At the special session of the General Assembly, August, 1920, Governor Bickett sent a special message to the General

Assembly recommending as strongly as he could three things: (1) a state sanatorium; (2) better schools for the education of the negro teachers; and (3) better and more cleanly accommodations on the passenger trains of the State. He requested that a legislative committee be authorized to investigate these matters and report to the regular session, January, 1921. The committee was authorized. It is expected that the next General Assembly will authorize and provide for a state sanatorium for negroes.

## BECAUSE COWS IS COWS, BUT FOLKS ARE JUST FOLKS

### The Sanatorium Dairy Herd is Free From Tuberculosis—An "Accredited" Herd

The dairy divisions of the United States and State Departments of Agriculture are making a campaign for tuberculosis-free dairy herds, called "Accredited Herds," in North Carolina, and we suppose this coöperation exists in other states. To become an accredited herd the herd must be "tested" at least

during the next twenty-four hours a certain rise of temperature, called a temperature curve. Those familiar with the subcutaneous tuberculin test in the human will recognize the similarity of the symptoms, except that nothing is said about general aching in the cow, called malaise in the human,



Sanatorium Herd of Jerseys

once a year for two years in succession and must be free from tuberculosis each time. The "test" consists of injecting a certain amount of tuberculin hypodermically into the tissues of the cow, beneath the skin, and a cow that has tuberculosis, or a "reactor," will show

because the cow cannot report on these symptoms, which seems to be the only instance where the tuberculous human is ahead of the tuberculous cow.

Now in case a cow with tuberculosis is found in the herd she must be removed immediately and for all time,

lest she infect the other cows. Then before the herd can become an accredited herd they must be found free from tuberculosis on two tests, one one year hence and the other two years hence.



Dairy Barn in Process of Completion  
in Spring of 1919.

Then most of the states, among them ours, are very particular that no cow that has tuberculosis shall be shipped into the State. We, therefore, require that before any cow can be shipped into this State she must have had this tuberculin test very recently, and it must have been by a duly graduated and licensed veterinarian, representing the state from whence the cow is shipped and also the United States, and the crate or car in which the cow is shipped must have a certificate signed by the above mentioned official nailed on it before the transportation companies will be allowed to transport her. Some shrewd, and we might say unprincipled, man found out that if a cow were given a certain dose of tuberculin a week or ten days before the "test" was given, she would not react to the test, even though she had tuberculosis at the time. So when the Sanatorium bought some fine Jerseys from Hood Farm some while ago it was with the proviso that they should be retested for tuberculosis at the end of two months, and if they or any of them reacted the purchase price was to be refunded, but before this agreement could be consummated Hood Farm required that the Sanatorium should furnish a certificate from the Dairy Division of the State Depart-

ment of Agriculture that its herd was free from tuberculosis, because said Mr. J. E. Dodge, manager of Hood Farm, "I do not want our cows to get tuberculosis after they go down and the penalty be imposed on us."



Sophie 19th's Grandson, 165221.

David Hildebrand, of Asheville, bought eighteen fine registered Holstein cows, and a proper certificate that they had been tuberculin tested and found free from tuberculosis accompanied them. On the first retest seventeen of the eighteen reacted and were slaughtered on account of having tuberculosis. Mr. Hildebrand had to bear the loss, because the above-mentioned dishonest trick had been played on him. He was so disgusted that he quit the dairy business.



Sophie Dorinda, 365603.

Lots of health certificates required for the transfer of a cow. Yes. A man can get a life insurance policy with fewer examinations than that.

Yes. Why be so particular and go to so much trouble and expense to keep cows from contracting tuberculosis when we don't bother ourselves very much about people catching it? Because cows is cows, but folks are just folks.

It stands to reason of we can stamp out tuberculosis in a herd of cows we can do the same thing in as many herds as we want and are willing to pay for. Yes, it has been done and is being done. It stands to reason that if we can stamp tuberculosis out of a herd of cows, yes, and out of many herds, that we could do the same thing for a group or community of people, or many communities. Yes it does, but no one, no community, no county or state has ever cared enough about people to do it. The town of Roanoke Rapids stands ready to do it. Her business men have offered to put up \$10,000 per year for five years and then carry all the expense thereafter, but the great State of North Carolina shook it head and said, no, we are too poor to join in such a thing as that—because cows is cows, but folks are just folks. Not that we would magnify cows less, but folks more.

The undersigned vouches for the truthfulness of all statements made in the foregoing article.

L. B. McBRAYER.

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## THE NORTH CAROLINA TUBERCULOSIS ASSOCIATION

When recounting the splendid work that has been and is being done by this Association, and its splendid close coöperation with every activity of the State Board of Health, particularly every thing that has a bearing on tuberculosis, we are inclined to feel that the North Carolina Tubercu-

losis Association has not had the public recognition that it richly deserves. It will be remembered that it secures its funds through the sale of Christmas Seals. It furnishes to local committees the seals and all other printed matter connected with the sale and in addition pays to the National Tuberculosis Association 5 per cent on the gross sales. The local committees where sufficient seals are sold to make it profitable so to do, are allowed to retain 75 per cent of the gross receipts of the sale for use in their own community, 25 per cent being forwarded to the State Association to defray the expenses of the sale, as mentioned above, and the remainder to be used in the State-wide campaign against tuberculosis. The North Carolina Tuberculosis Association is permitted by its charter to secure donations from any source. We are appending hereto the budget of the Association for the current year, and in addition thereto we desire to say that the Association has fostered public health nursing in North Carolina since its beginning and continues so to do. It coöperates with the Bureau of Tuberculosis in building up public health nursing in North Carolina, the coöperation among other things consisting of much financial aid; until a State Director of Public Health Nursing was in the field, possibly the first State in the south to have such an official. And this was continued with Miss Rose M. Ehrenfeld as director, until December 1, 1919, when it was considered of sufficient importance to turn over to the State Board of Health when a special bureau was created, known as the Bureau of Public Health Nursing and Infant Hygiene, and Miss Ehrenfeld continues as director.

The Association has helped local towns to put on public health nursing, among them being Raleigh, Charlotte, Tarboro, etc. The State Asso-



ciation has coöperated largely with the work among the negroes and has almost financed the whole of it this year.

The Association finances and sponsors entirely the Modern Health Crusade, which teaches health and hygiene by "doing the things needful."

When the Medical Staff at the Sanatorium was longing and crying for a much-needed X-ray equipment, and had no money with which to buy it, the North Carolina Tuberculosis Association came forward and provided it. When the Sanatorium needed a building to house the workshop for the vocational training of the ex-service men taking treatment at the Sanatorium and had no funds, the State Tuberculosis Association came forward with a loan.

You will see by the budget which follows that depending solely on appropriation made by the General Assembly the State-wide campaign against tuberculosis in North Carolina would have been meager compared with what it has been with the coöperation of the Tuberculosis Association—for all of which we are thankful.

### BUDGET OF STATE ASSOCIATION NEEDS FOR 1920-1921

For seal sale expenses.....	\$ 3,000.00
To complete X-ray equipment at State Sanatorium.....	647.60
Clinic physician and consultant expert in tuberculosis: For salary, \$3,500.00, traveling expenses \$1,500.00 .....	5,000.00
To give postgraduate course in tuberculosis nursing to graduate nurses .....	1,000.00
Public health nursing for the negroes .....	1,000.00

Educational work among the negroes by means of moving picture car carrying pictures of a health, educational and entertaining nature .....	10,000.00
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Other health work among negroes by means of trained workers who educate their race in preventing the spread of communicable diseases by lectures and demonstrations, in churches and schools, and in homes by personal aid....	5,000.00
Establishing the Modern Health Crusade in schools..	2,500.00
For expense of publicity director whose energies will be devoted to telling the people how tuberculosis is caused, how prevented, and how cured .....	1,800.00
For publishing and distributing bulletins, pamphlets and articles on the care and prevention of tuberculosis..	3,000.00
Preparation of movie films dealing with cause, prevention, and cure of tuberculosis .....	2,500.00
Salary of clerks, stenographers, and other office force....	1,000.00

Total.....\$36,447.60

### THE MODERN HEALTH CRUSADE

Since 90 per cent of our American school children leave school at or before reaching the eighth grade, public health must be taught in the grades if the majority is to be reached.

We are glad to state that a large number of superintendents, principals, and teachers of schools in North Carolina have realized that good health hab-

its formed by today's pupils means conserving the health of tomorrow's citizen. It takes only a few minutes a day of the teacher's time to give the children the opportunity to acquire healthful habits which will enable them to become strong, healthy men and women.

The Modern Health Crusade presents a simple system of teaching health habits to the children, with the minimum expenditure of time and money.

The cost of the Crusade is very small, compared with the price of other textbooks, the price being but 7 cents per capita, if the entire program is used or a very efficient Crusade may be inaugurated for 2 cents per capita by eliminating the award of the Knight's Banneret Pin. This is the last award given and is a gold pin of beautiful design.

Appropriation to cover cost of Crusade supplies should be made by the school board. If funds are not available from this source the chairman of the sale of Tuberculosis Christmas Seals, sold under the direction of the North Carolina Tuberculosis Association, will be glad to aid if there are funds in the treasury. The public health nurse for your county can be of assistance in securing funds or supplies may be paid for by each school from receipts derived from box parties, entertainments, etc.

During recent years a great many tuberculosis experts have reached the conclusion that considerable tuberculosis that develops in adult life is the outcome of childhood infection. The susceptibility of the child being caused by lowered resistance as the result of malnutrition, insufficient rest, insanitary conditions, lack of proper medical attention or failure to secure sufficient exercise in the open air. The aim of the Crusade is to supply these deficiencies and build up resistance not only to tuberculosis but to any of the infectious diseases that attack the human body at the time when resistance is lowered.

The Crusade is not intended to supplant any of the regular studies in hygiene and physiology, but to make these studies more helpful and pleasing by introducing an interesting element therein.

The children are zealous in keeping the health rules as they are awarded certificates and badges and given titles for their faithful performance; and interest is maintained by the desire to excel. We know the teachers that use the crusade in their schools will find that the children not only improve in health but show greater aptitude for other studies by reason of increased efficiency.

The Crusade has been used successfully in schools all over the United States, receiving the approval and support of such persons as Dr. William Burdick, former President of the American Physical Education Association; Surgeon-General Hugh Cummings of the United States Public Health Service; C. N. Kendall, Commissioner of Education of the National Educational Association, and other progressive health and educational workers.

President Wilson endorsed the Crusade in the following words: "It is deeply gratifying to me, as it must be to every patriotic citizen, to know that the children of the country are striving so earnestly to coöperate in building up the health of the nation. It is my earnest hope that every boy and girl will continue the good work until the twenty million school children of the United States are united in one great cause of better health for the children."

Last year North Carolina enrolled 52,000 Crusaders in the schools for white children and 12,700 in the colored. Let's make 100 per cent of the children crusaders for better health this year. For supplies and information relative to conducting the Crusade, address the North Carolina Tuberculosis Association, Sanatorium, N. C.

# DAILY HEALTH GUIDE

## FOR BOYS AND GIRLS

### MORNING

*Brush teeth—Toilet*

### BREAKFAST

Fruit, cereals and plenty of milk,  
eggs, bread and butter

No coffee nor tea at any meals

*Eat slowly, walk to school. (Don't run.)*

### SCHOOL

GOING and COMING

Take ten deep breaths slowly,  
shoulders straight and head up.

*Don't sneeze near another person.*

*Use your handkerchief. Don't spit.*

### NOON

*Wash your hands and face; use soap.*

*Glass of water before eating*

### DINNER

Besides meat and potatoes, or  
rice, eat plenty of vegetables *and*  
only plain puddings or fruits.  
Chew each mouthful thoroughly.

### AFTERNOON

*Walk slowly after eating. Keep cheerful.*

*Play out of doors after school.*

### EVENING

*Wash Face and Hands. Glass of water*

### SUPPER

Plenty of milk and fruits *and* fish or  
eggs instead of meat.

Fried foods are hard to digest.

### WINDOWS OPEN

*Top and bottom*

**SLEEP OUT OF DOORS WHEN YOU CAN.**



**A GOOD WASH**  
Before breakfast.  
Brush your teeth.



**FRESH AIR**  
Study hard.  
Sit up straight  
at your desk.



**GLASS OF WATER**  
Brush Teeth.  
A hot bath  
twice a week



**UP SMILING**  
No loitering  
in dressing or  
chores



**RECESS**  
Play hard.  
Put nothing dirty  
in your mouth.



**EARLY TO BED**  
2 hours sleep for  
young children,  
en for all others

ISSUED BY THE NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS, 105 E. 22ND ST. NEW YORK.

Adapted by the National Tuberculosis Association from the "Daily Program" chart of the Wisconsin Anti-Tuberculosis Association.

Is there a "Daily Program" hanging in your school room?  
If not, why not?



# DID YOU MURDER ANY OF YOUR FRIENDS?

3005 PEOPLE WERE MURDERED IN NORTH CAROLINA LAST YEAR

You are your own **JUDGE** and **JURY** and can obtain a verdict of "**NOT GUILTY**"—if you are innocent.

The number mentioned above were killed last year by **TUBERCULOSIS**.

## TUBERCULOSIS IS PREVENTABLE AND CURABLE

**TUBERCULOSIS** is spread by careless persons coughing without shielding their mouths and by spitting on the ground or floor.

If you have to spit, use a waterproof paper sputum cup. One usually lasts a day and can easily be burned after using. They are made in two styles: bedside cups with tin holders for patients confined to bed; pocket cups for the "up patients." The tin holders cost 25c. The cups are 65c. per hundred, post paid, and can be ordered direct from the Bureau of Tuberculosis, Sanatorium, N. C.

It is not dangerous to work with a careful tubercular person. Make it easy for him to be careful by insisting on the use of sputum cups.

**BUREAU OF TUBERCULOSIS, Sanatorium, N. C.**

POCKET CUP

BED-SIDE CUP



# Is the Fight Against Tuberculosis Worth While?



These 1,800 Happy People Represent the Number of Lives Saved in  
the Fight Against

## TUBERCULOSIS

in 1919 over 1913

If 1,800 Lives Were Saved Last Year, Can We Not Make a Greater  
Reduction This Year?

THE ANSWER IS, "YES"

If **YOU** and **YOU** and **YOU** Will Aid

HOW?

Allow No One to Kill You With Tuberculosis, and Kill No One Yourself

You are told how Tuberculosis is spread, the means to prevent infection, and the treatment necessary if infected, in the pages of this Bulletin.



# The Health Bulletin

Published by THE NORTH CAROLINA STATE BOARD OF HEALTH

This Bulletin will be sent free to any citizen of the State upon request.

*Entered as second-class matter at Postoffice at Raleigh, N. C., under Act of July 16, 1894.  
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Vol. XXXV

DECEMBER, 1920

No. 12

## A HEALTHY NEW YEAR TO YOU

The New Year can bring you no greater blessing than health. Given this, all other things are possible for you. Yet health is something that cannot be handed to you as a gift. It is a thing that you must achieve for yourself. That better health and the consequent greater enjoyment of life may be attained by you for the New Year, and the years to come, the following simple suggestions are offered:

Ventilate every room you occupy.

Wear loose, porous clothing, suited to season, weather, and occupation.

If you are an indoor worker, be sure to get recreation outdoors. Sleep in fresh air always; in the open if you can.

Hold a handkerchief before your mouth and nose when you cough or sneeze, and insist that others do so, too.

Always wash your hands before eating.

Do not overeat. This applies especially to meats and eggs.

Eat some hard and some bulky foods; some fruit.

Eat slowly—chew thoroughly.

Drink sufficient water daily.

Evacuate thoroughly and regularly.

Stand, sit, and walk erect.

Do not allow poisons and infections to enter the body.

Keep the teeth, gums, and tongue clean.

Work, play, rest, and sleep in moderation.

Keep serene. Worry is the foe of health. Cultivate the companionship of your fellow men.

Avoid self-drugging. Beware the humbug of the patent medicine faker.

Have your doctor examine you carefully at least once a year. Also consult your dentist at regular intervals.



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RICHARD H. LEWIS, M.D., LL.D.,	Raleigh		Greenville
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RONALD B. WILSON, Director Public Health Education.  
C. A. SHORE, M.D., State Laboratory of Hygiene.  
L. B. MCBRAYER, M.D., Superintendent of the State Sanatorium for Treatment of Tuberculosis and Chief of Bureau of Tuberculosis.  
G. M. COOPER, M.D., Chief of Bureau of Medical Inspection of Schools.  
K. E. MILLER, M.D., Director of County Health Work.  
MISS ROSE M. EHRENFELD, R.N., Chief of Bureau of Public Health Nursing and Infant Hygiene.  
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H. E. MILLER, C.E., Chief of Bureau of Engineering and Inspection.  
F. M. REGISTER, M.D., Deputy State Registrar of Vital Statistics.  
J. S. MITCHENER, M.D., Chief of Bureau of Epidemiology.

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## SERVICE

The State Board of Health offers to the people of North Carolina, without charge, the services of experts thoroughly trained with particular regard to the needs of this State. Advice will be given promptly upon any question affecting the public health. Address any inquiry to the State Board of Health, Raleigh.

## FREE LITERATURE

The State Board of Health has prepared special literature on a large number of subjects which are offered without charge. If you are interested in any one or more subjects affecting your health, write the State Board of Health, Raleigh, requesting special literature, and it will be sent to you.

## THE HEALTH BULLETIN

THE HEALTH BULLETIN is issued monthly. It will be sent without charge to all citizens of the State who request it.

# THE Health Bulletin



PUBLISHED BY THE NORTH CAROLINA STATE BOARD OF HEALTH

Vol. XXXV

DECEMBER, 1920

No. 12

## A COVENANT

*By* DR. WILLIAM A. EVANS

I pledge myself to so live that I may be well, and to this end I agree to abide by these, My Laws:

I accept the stewardship of my body, promising not to violate the rights thereof by acts of omission or commission.

I will allot a portion of each day for work, another portion for play, and another portion for rest, and I will give to each appropriate energy and thoughtfulness.

I will develop for myself those habits which make for health, eschewing all those habits and contending against all those customs which harm me and my race.

I will avoid all poisons of whatsoever kind.

I will do unto others as I would have others do unto me. I will not expose others to contagion borne by me, and I would have them in a like manner protect me.

I will respect the rights of others to have sunlight, clean air, clean water, and healthful food.

I will eat as my work demands, and will not overeat in response to appetite or whim.

I will make use of my muscles in work or play during some part of each day.

I will devote to sleep, not only the required hours, but keep my mind in that state of quiet calm which is necessary for recuperation and rest.

I will not worry. Whatever fortune may bring me I will accept with calmness, preserving my equanimity alike in seasons of adversity and of plenty.

## DEBITS AND CREDITS IN STATE HEALTH WORK

We assume that the people in North Carolina are interested especially in two things with respect to the work of the State Board of Health: (1) what the Board spends; (2) what it gets for the expenditure. This statement, therefore, will deal in a manner as brief as clearness permits with the debit and credit side of the State's account with public health.

## DEBITS

During the biennial period of 1919-20 the average annual expenditure of the State Board of Health, including the Laboratory but not the Sanatorium, was \$202,592.80.

## CREDITS

## Cost Values

*Item 1.* The work of the State Laboratory of Hygiene may be stated briefly and in the terms of its financial equivalents in the table as set forth below. That is to say, if there had been no State Laboratory of Hygiene in existence the work done would have cost the citizens of the State the amount shown in the table.

*Item 2.* The State Board of Health, through its officers, during the past two years has given complete anti-typhoid vaccinations to 165,000 citizens of the State. Without this activity of the Board this work would have cost our people \$2 per vaccination, a total of \$230,000. During the same time, through our officers and agents, 31,550 people have been vaccinated against smallpox, a piece of work which would have cost not less than \$30,000. The vaccinations, then, carried out under the direction of the Board of Health during the past two years would have cost \$260,000.

*Item 3.* During the past two years, largely during the last 14 months, 28,000 open-back, disease-spreading, unsanitary privies have been replaced, either with closed sanitary privies or sewer connections. In the building of tens of thousands of sanitary privies throughout the rural South the experience of the International Health Board, largely interested and instrumental in this phase of sanitation, is that it costs about \$2.50 to reach and persuade the average rural resident to build a sanitary privy. Applying this cost figure

19,707 Wasserman and Gonorrheal fixation tests @ \$5.00.....	\$ 98,535.00
4,910 examinations of water @ \$5.00.....	24,550.00
799 examinations of urine @ \$5.00.....	3,995.00
16,567 other examinations, averaged @ \$2.50.....	41,417.50
755,135 doses typhoid vaccine @ 50c.....	377,567.50
15,210 doses whooping cough vaccine @ 50c.....	7,605.00
179,815 doses smallpox vaccine @ 15c.....	26,972.25
Diphtheria antitoxin distributed:	
6,525 1,000 unit packages @ \$2.00.....	\$13,050.00
1,931 3,000 unit packages @ 3.50.....	6,758.50
8,245 5,000 unit packages @ 5.00.....	41,225.00
10,626 10,000 unit packages @ 7.50.....	79,695.00
	<hr/>
	140,728.50
Tetanus antitoxin @ \$3.50.....	2,338.00
815 Pasteur treatments distributed (low estimate).....	16,300.00
	<hr/>
Total.....	\$740,008.75



of \$2.50 to the privies built within the State during the last two years this piece of work would have a financial equivalent of \$70,000.

*Item 4.* During the last two years 25,587 public school children have been given dental treatment, 44,092 permanent fillings having been made, and the mouths of 9,000 other school children were examined and they and their parents given professional advice. This work, if done at prevailing dental rates, would have cost the parents of these children \$117,275.

*Item 5.* During the last two years, largely during the last 14 months, 150,000 school children have been examined by their teachers in accordance with instructions from the Board of Health. Of these, 60,700 have been examined by school nurses, especially trained in this work and working under the direction of the State Board of Health; and of these, 2,500 have been operated on for diseased tonsils and adenoids at a cost to their parents of a little less than \$10. The ordinary price for these operations is \$35. The saving here to the citizens of the State on cost is \$62,500.

*Item 6.* During the last two years 60,000 persons suffering from venereal diseases have been treated in clinics under the supervision of the State Board of Health. The cost of these treatments at regular rates would have been \$120,000.

*Item 7.* The State Board of Health has succeeded in interesting other agencies, including the International Health Board, the Federal Government, the American Red Cross, the American Social Hygiene Association, and the counties of the State, to the extent of securing during the past two years \$11 from outside agencies for State health work for every \$17 the State appropriates, or in a gross sum, for health work additional to that provided for by the State appropriation \$273,633.42.

In conclusion, the total saving in cost values alone to our people, as above stated (and this does not include many minor items which might have been given) amounts to \$1,580,908.42.

### Vital Values

By the term "vital value," as distinguished from "cost value," we mean to indicate the value in earning capacity of health and life saved through such measures as those enumerated above. For example, the Laboratory work has a cost value to our people, that is saves them, \$740,000 in work which the Laboratory does, and the vaccinations done by the State Board of Health and its agents have a cost value of \$260,000, but the number of days of sickness prevented, the deaths postponed, the increase both in quantity and quality of earning capacity, that is, the vital value, far exceeds the cost values.

Another point which is not to be lost sight of here is that had not the State done this work most of the cost value and vital value could not be credited to the State—the work would not have been done.

*Item 1.* The typhoid death rate in North Carolina in 1914, the first year in which deaths and their causes were recorded under the Vital Statistics Law in this State, was 35.8 per hundred thousand population. It is now, in 1920, 10.6. The significance of this reduction perhaps is more clearly appreciated by giving the number of deaths and number of cases per year since 1914. In 1914 there were 839 deaths and 8,390 cases; in 1915 there were 744 deaths and 7,440 cases; in 1916 there were 700 deaths and 7,000 cases; in 1917 (the year of mobilization when the general death rate and special death rates for the entire country increased) there were 726 deaths and 7,260 cases; in 1918 there were 549 deaths and 5,490 cases; in 1919 there were 427 deaths

and 4,270 cases; in 1920 there will be slightly less than 275 deaths and 2,750 cases. Here is a saving of 564 lives and the prevention of 5,640 cases of typhoid fever that would be occurring annually in this State, would have occurred this year, had the reduction in this disease since 1914 not been brought about. A minimum cost in physicians' bills, nursing, and druggists' bills and loss of productive labor for each case of typhoid fever is \$200. The prevention, therefore, of 5,640 cases means the saving of \$1,128,000. The earning capacity of the average person who dies from typhoid fever is \$2,000 and the saving, therefore, of 564 lives is equivalent to another \$1,128,000. The saving to the State on this one item alone amounts, therefore, to more than ten times the total cost of the health work of the State, that is, to \$2,256,000.

*Item 2.* The death rate from diphtheria has been reduced during the last five years from 22.3 deaths per hundred thousand population to 9.5 deaths for the same population, or in actual figures from 525 deaths to 242 deaths, a saving of 282 lives and the prevention of 3,300 cases of the disease. The cost in doctors', druggists', and nursing bills, and loss of time from labor for the average case of diphtheria is not less than \$25. The prevention, therefore, of 3,300 cases means the saving of \$72,500. The economic value of the 282 lives saved, on account of most of these lives being children, may be safely considered at not less than \$1,000 per capita, or a total saving of \$282,000, a grand total in the prevention of sickness and deaths from this disease of \$354,500.

*Item 3.* A total of 52,472 cases of contagious diseases have been quarantined and reasonable restrictions placed about these foci of infection. If we assume that but ten per cent prevention has been effected this would mean the prevention of 5,246 cases of contagious

disease and a saving of not less than 250 lives. Again giving the cost of the average case of these diseases prevented at the censurably low figure of \$25 and the economic value of the 250 lives saved at \$1,000 apiece, we have here another saving of \$281,150.

*Item 4.* The death rate of North Carolina for 1919, the last figures available, was 12.4 deaths per thousand of the population. For the entire registration of the United States for the same year the rate was 12.9. During the last five years the death rate in North Carolina has been lower than that of any of the older states of the Union. The newer states in the West, with a larger emigrant population from foreign countries than the older Eastern states and, therefore, with a larger proportion of the middle-aged healthy group and without the liabilities of a large infant or a large old-age population, have lower death rates than this State, but North Carolina's death rate is the lowest of any of the old states and the lowest of any known death rate on the coast from Maine to Texas. This favorable index of the general health conditions in North Carolina is maintained notwithstanding an extensive prevalence of malaria and the milder types of hookworm disease, and, what is much more important in its bearing upon the death rate, the highest birth rate of any State in the Union. The birth rate in North Carolina for the last five years has averaged about 31 births per thousand population, and promises in 1920 to reach 33 per thousand population. The average rate of the United States would probably not exceed 25 or 26 per thousand of the population. High birth rates, in contributing to a large infant population which age group has naturally a high mortality, tends to increase the death rate. This State, however, has the distinction of maintaining the highest birth rate and one of the

lowest death rates. The fluctuation of the death rate in North Carolina one point, that is, one less death or one more death per thousand of the population means 2,500 less deaths or that many more deaths per year, the population of the State being 2,500,000. As there are 700 days of sickness for each death a decrease in the general death rate of one per thousand would mean, in addition, the prevention of 1,750,000 days of illness, or the saving of 57,000 persons one month's illness during the year, or preventing the illness of 4,800 persons for an entire year. It seems a most reasonable assumption to say that the general effect of public health work in North Carolina amounts to at least the reduction of one death per thousand of the population and its coincident saving in time lost from sickness. This much human life, 2,500 whole lives saved, and 1,750,000 persons saved from a day's illness during the year, has, if we take \$2,000 as the value in earning capacity of the average life saved and \$2 as the cost per day of sickness, losses in productive labor, cost of doctors, druggists, etc., a total value of \$8,500,000.

### Intangible Values

There are many important activities of the State Board of Health that cannot be reduced to terms in dollars and cents which express their value or indicate the essential part which they play in health work. As such, the following activities or items may be mentioned:

*Item 1.* The Bureau of Vital Statistics during the past two years has supervised and directed the work of 1,419 local registrars; has kept in close touch through reports and correspondence with 2,500 physicians, 4,000 midwives, and 600 casket dealers, that is, those concerned in a professional and business way with births and deaths; has recorded and classified, according

to location, county, town, and township, according to race, age, and according to 189 causes of deaths, 64,000 deaths, and 153,000 births. This work has required a considerable and an experienced clerical force of 14 persons. The activity of this Bureau is indicated by the elaborate system of card indexing and tabulating necessary to keep the aforementioned data regarding deaths and births, and by the volume of correspondence of this bureau, to wit: 43,250 individual letters and 25,000 form letters. To know the natural increase of the population, how many people die each year, in what counties, towns, and townships they die, and from what causes of death, to know what deaths, with respect to causes, are on the increase, and what are on the decrease, and how deaths from various causes are responding to public remedies—this information is as necessary to intelligent health work as bookkeeping is to a business. Moreover, such records have important legal value. Then there is the sentimental value for what it is worth of the State's permitting no baby to be born or no decrepit and humble citizen to depart without its taking official note and making permanent record of these two principal events in life, the beginning and the end.

*Item 2.* During the past two years the State Board of Health has examined, passed upon with its approval or required certain alterations to be made in the plans and specifications for 73 public water supplies and sewerage systems. In doing this it has (1) protected the towns installing these public utilities against financial waste resulting from the purchase or installation of imperfect work; and (2) it has safeguarded municipalities taking water supplies from streams against possible pollutions of sewerage discharge by municipalities either up the stream or on some tributary thereof. The saving



in money and the saving in lives from this work is considerable, but to attempt to state it in definite terms would be nothing better than a mere guess.

*Item 3.* A total of 5,000 expectant mothers and 6,000 mothers with infants, a total of 11,000 women, have been aided through a system of correspondence and with carefully prepared literature in protecting themselves and their unborn children against the dangers of pregnancy and labor, and advised as to the rearing of their infants. The need of this work is indicated by the facts that every year 600 women die in childbirth in North Carolina, and that of the 33,000 deaths occurring annually in this State 11,000 are within the first five years of life.

*Item 4.* The State Board of Health is now operating a county educational unit for informing our people on the subjects of the importance of chastity and its bearing on health and character and the dangers of venereal diseases. The unit equipment consists of a large one and one-half ton truck of the type used in France for similar purposes, and a staff of five persons: (1) a physician to visit the county where the campaign is to be carried on in anticipation of the truck, and to arrange the itinerary of showings and lectures and through wide publicity to acquaint the people with the character of the undertaking and to encourage them to take advantage of the lectures and shows; (2) an expert mechanic who drives the truck and operates the moving picture machine; (3) a male lecturer for white audiences; (4) a woman lecturer for women; and (5) a male colored physician to lecture to negroes. Seven moving picture films, accurate in their teaching and most entertaining in the way of presenting the subjects, are shown. During the three months that this outfit has been in operation 38,500 persons have seen it, a total of 12,000 persons per month, or 400 per day. This

work, though just beginning, will be continued during the next two years until all the people of North Carolina have been instructed by the visual method, films, on the importance of continence and the dangers of incontinence.

*Item 5.* An educational campaign against preventable disease has been carried on during the last biennium to the following extent: (1) a 48,000 monthly edition of THE HEALTH BULLETIN, which invites comparison with that of any other State or city, has been distributed on request to the people of the State. The general reputation of the BULLETIN makes further comment on it unnecessary; (2) the distribution, on request, of 1,175,000 pamphlets and leaflets on various health subjects. This is equivalent to a daily distribution of 1,600 pieces of literature. This demand for information on the subject of health, together with a daily correspondence of 135 letters, more than anything else, indicates the interest that the citizenship of this State has in the problem of health. The value of educational work cannot be stated in dollars and cents, any more than one may so estimate the value of the Bible, the work of the churches, the value of the public press, or public schools.

In conclusion, we believe that the public health program of the State justifies itself when considered from a viewpoint of cost values, vital values, or intangible values. And perhaps the greatest of these values are the intangible ones. The intangible values are more closely associated with and more a part of the immaterial than the material life; they are the imponderable and spiritual values, or the values of mind and impulse and motive and ideals; they cannot be transmuted into currency. We may measure increases in the quantity of life, decreased death rates and lessened sickness, but it is impossible to weigh the value of im-

provements in vital quality, and after all, the State's interest, its ultimate object is not mere quantity of life, increase in the length of days of the average citizen, but a happier, more efficient citizenship, a higher and finer quality of life.

"We live in deeds, not years; in thoughts, not breaths;  
In feelings, not in figures on a dial;  
We should count time by heart throbs.  
He most lives  
Who thinks most, feels the noblest,  
acts the best."

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## WORK OF THE EXECUTIVE OFFICE

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### CHARACTER OF WORK

#### Duties

The duties of the executive office are : (1) to assume primary responsibility for the enforcement of the more important State health laws; (2) to consider and determine, with the advice and consent of the Board, what should be the more important public health policies of the State; (3) to secure the needed legislation that will make possible the adoption of desirable health policies; (4) to supervise and assist in the execution of established policies. More fully and analytically stated, the duties of the executive office are :

1. *Public Health Law Enforcement.* The enforcement of law rests, in a general way and broadly, upon the judicial machinery of the State. On the other hand, it is not only the privilege but the duty of any citizen to see that the violation of any law is brought to the attention of the courts and dealt with. The more thorough understanding of the purposes and the character of the public health laws and the keener appreciation of their importance imposes in a special way upon the executive office of the State Board of Health the duty of seeing that these particular laws are fully complied with.

2. *Determination of Policies*—The duty of considering and formulating for the action of the Board what should be the more important public health policies of the State rests largely with

the executive office of the Board on account of its primary and general responsibility for the development of an effective program of human conservation.

3. *Obtaining Legislative Adoption of Policies*—After the Board has considered and definitely decided upon a course of action it becomes the duty of the executive office to bring to the attention of the people the need of the course of action approved by the Board, and to so inform, interest, and appeal to the public and reflexively and directly to the General Assembly as to secure legislative approval and provision for the public health policies which have been adopted by the State Board of Health.

4. *The Selection of an Executive Staff.* The efficiency of any agency is conditioned largely upon the personnel who are employed in its activities. The responsibility of finding and securing persons properly qualified by native endowments, training and experience to direct the special bureaus or divisions entrusted with carrying out the established policies of the Board rests largely with the executive office.

5. *Supervision and Coördination of the Special Bureaus*—As has been pointed out heretofore the organization of the executive work of the Board embraces a number of special bureaus which are held responsible for some

definite State health policy, and which are so organized as to be independent of each other. Naturally, these bureaus and divisions in the character of their work are closely related and some means of coördinating their activities is necessary, and this means the executive office supplies. In the development of new bureaus entrusted with recently adopted policies a considerable amount of supervision by the executive office is called for.

6. *Taking Care of the General Problems of the Board*—The majority of calls by letter or person upon the Board for service can be and are referred to the special bureaus of the Board concerned directly with the sort of service called for in the letter or by the visitor; however, there are a number of calls made on the Board for service that are general in character, or not yet provided for by some special agency, and these services, necessarily, have to be supplied by the executive office.

7. *The Educational Work of the Board*—The interest and support of the people in public health is in proportion to their understanding of the problem. To reach the people, therefore, with information as to what the public health needs of the State are and how the Board proposes to meet these needs is, of all the Board's duties, the most fundamental and the most important; moreover, the educational work of the Board is of a general character, dealing with the interests of all the special bureaus or divisions and, therefore, belongs largely to the executive office; the interest of which is not particular but general with respect to health problems.

8. *Accounting*—Receiving, disbursing and accounting for public monies is a duty that rests upon the executive office because of its primary and general responsibility for the interests of the Board.

## Methods

The methods of work which are followed depend largely upon the character of the duty which the executive office seeks to discharge. For this reason it is well in the discussion of methods to relate them to the special duties of the executive office as above set forth.

1. *Methods of Law Enforcement*—Investigations as to violations of the more important public health laws of the State and the bringing of prosecutions where violations are found, are carried out largely as a part of the special activities of the bureaus of Vital Statistics, Epidemiology, and Inspection. These three Bureaus maintain a field force of inspectors which varies at different times, but which is equivalent to ten full-time officers. Law enforcement will, therefore, be more fully discussed in connection with the work of these special bureaus. The responsibility falls, however, to the executive office to see that the bureaus fearlessly and without discrimination enforce the important laws entrusted to their execution. The larger work of the executive office in law enforcement, however, concerns itself with bringing to public attention, more especially through the BULLETIN, the principal State health laws and the need of their careful observance, and in this way building up a public sentiment favorable to the observance of the public health laws and sympathetic with the judicial machinery in imposing penalties upon those who violate them.

2. *Methods for Determining Policy*—In determining the public health policies of the State it is necessary (a) that the executive office secure information through special and regular reports on the vital statistics of the State, and in this way be fully cognizant at all times of the vital conditions of the State as shown by the State's birth rate, the State's general death rate, the



State's special death rates for certain diseases, the death rates in the State by counties, by races, and by seasons; (b) That the executive office secure information, through public health literature, books, and periodicals, as to the more recent developments and discoveries in public health work; (c) that the executive office, by keeping in touch through conferences with other State health officers and Federal health officers, be thoroughly conversant with the methods and accomplishments of other State departments of health, and that the executive office be alert to those larger interstate movements, especially those related to action by the central government, in order that whenever and wherever possible these larger movements may be influenced to the advantage of the State.

**3. Methods for Securing Legislative Action**—To secure the necessary measures and appropriations for the development of the State health policies, the following methods are pursued: (a) the people of the State are informed, through bulletins, exhibits, the press, and public addresses, as to vital conditions and as to necessary measures and appropriations for favorably influencing the vitality and physical efficiency of North Carolina people. In this way the executive office seeks to develop a favorable public sentiment for the development of its more important public health policies; (b) the executive office seeks to find and to interest certain individuals qualified by heart and head and position, for influencing, introducing, and supporting needed legislation.

**4. Methods for Selecting the Executive Staff**—To find and secure, with the available means, a personnel for the bureau, division, or agency of the Board that is to be relied upon for carrying into successful execution some special and important public health policy, calls for (1) an acquaintance with those who are in touch with men

qualified for such positions, and (2) a judgment of men. This judgment of men by which an administrative officer selects his assistants is, of course, basic in the success or failure of an administration.

**5. Methods for Supervising and Coordinating the Work of the Board**—In giving assistance to members of the executive staff charged with carrying out certain special health policies, the executive office attempts to keep in touch with the work of each division or agency through regular monthly reports, special reports, and conferences from time to time. Consideration for the right amount of assistance—not too much and not too little—is regarded as important. Too much supervision tends to smother individuality, to stifle the pride of accomplishment, to break down the self-confidence of a bureau; while, on the other hand, too little supervision not infrequently results in a useless expenditure of funds.

**6. Methods for Caring for General Work of the Board**—The general work of the Board is a matter largely of correspondence and conferences, the details of which are indicated in the following section of this statement on routine work. As will be observed in the detailed statement the general business of the Board consists of a very extensive correspondence, and a considerable amount of time devoted to conferences.

**7. Methods of Popular Education**—For reaching the public with information on the health problem which they need and which is necessary to secure their interest in and their support of the policies of the Board, several means are in use. These include popular addresses, information through the press, the preparation and distribution of special pamphlets on the more important health problems and last and most important of all, the publication of a 48,000 monthly edition of a regular

BULLETIN, or popular magazine. Popular addresses, on account of the high cost of railway and automobile transportation and hotel expenses, and more especially, on account of the small numbers reached, is, relatively speaking, too expensive a method for informing and interesting the people generally in the question of public health. The tremendous demands, the multiple requests of various agencies, interested in some special propaganda, on the press, generous and sympathetic as the press unquestionably is, have overreached the capacity of the press to supply space for this sort of material or to furnish personnel to examine and discriminate between propaganda articles worthy and unworthy of newspaper attention, so that it is becoming more and more difficult to use the newspapers for popular health education. It is only just to state, however, in this connection, that our State press has been extremely partial to material sent out by the State Board of Health, and has so assisted in the health movement in North Carolina as to place this Board and the people generally under lasting obligations. The use of popular pamphlets on special subjects, like the pamphlets on typhoid fever, diphtheria, malaria, tuberculosis, sanitary privies, etc., which are supplied only on special request, affords perhaps the most economical means of popular public health education, for the reason that only those with some special interest receive the pamphlets and most of them are used. These pamphlets, however, would not be used, would remain in the office, unasked for, were it not for other means, particularly the press and the BULLETIN for reaching the general population and informing them of the existence of these special pamphlets and their value. The State Board of Health BULLETIN, founded shortly after the Board started, the BULLETIN making its first appearance in 1886, has been steadily growing

with the development of a more extensive popular interest in the health problem until, from an edition of a few hundred monthly Health Bulletins, it has now become one of the best known periodic publications existing in North Carolina, reaching 48,000 homes every month, and coming in contact with at least one-tenth of the population of the State. THE BULLETIN is by all odds the most important educational means which the State Board of Health has. It not only develops but it serves to maintain the public interest in the undertakings of the State for the conservation of human life and health.

*S. Methods of Accounting*—The book-keeping of the executive office is entrusted to a thoroughly reliable, careful, and bonded clerk, whose system of accounting has been devised by an expert accountant and whose work is audited at regular intervals.

### Routine Work

The routine work of the executive office is shown in the tabulation on page 13.

### Results Obtained

*Organization of Bureaus*—(1) The executive office planned in general, not in detail, and assisted in inaugurating the work of the Bureau of Engineering and Inspection. The work of this bureau is largely in the nature of a pioneer undertaking, no other State in the Union having, by State enactment, attempted to regulate the privy problem by prescribing the construction and manner of maintaining privies. The work of this bureau involved the study of all existing types of family toilet arrangement, with the selection of those types best suited to the economic, educational, climatic and geographic conditions existing in this State. The work of organizing this bureau included, further, the drafting of proper rules and regulations for the maintenance of closets and the employment and training of a corps

Letters received .....	18,197
Magazines and bulletins received and reviewed .....	12,777
Letters written:	
Individual .....	9,365
Multigraph .....	18,274
Total .....	27,369
Articles written:	
Newspaper (107) words .....	39,400
Bulletin (41) words .....	53,150
Official publication (6) words .....	
Special (8) words .....	29,051
Forms and placards prepared (16) words .....	4,900
Telegrams sent .....	707
received .....	564
Jail reports received and examined (1919) .....	85
Jail score cards copied and mailed (1919) .....	45
Convict camp reports received and examined (1919) .....	98
Convict camp score cards copied and mailed (1919) .....	23
State institution inspection reports copied and mailed (1919) .....	68
Hotel certificates copied and mailed (1919) .....	37
Hotel certificates mailed (1919) .....	118
Vouchers issued .....	4,939
Sanatorium vouchers examined and mailed .....	2,153
Receipts issued .....	569
Financial reports prepared .....	137
Miscellaneous reports prepared .....	34
Multigraph forms and letters executed for various bureaus .....	311
Number of pieces .....	334,477
Requisitions for printing .....	506
Number of pieces .....	5,808,379
Pamphlets, leaflets and placards distributed .....	668,187
Monthly health bulletins mailed .....	1,152,000
Hours spent in conference .....	326 1-3
Days out of office on official business .....	204 3-4

of ten sanitary inspectors for giving the law effect.

(2) During the last two years it became necessary, on account of the desire of the Red Cross to participate in the public health work of the State and on account of the resignation of Mrs. Kate Brew Vaughn, director of the Bureau of Infant Hygiene, to reorganize that bureau and to enlarge the scope of its activities so as to include public health nursing. The executive office had to give considerable time in arranging the terms of coöperation with the Red Cross and to the reorganization of the bureau.

(3) After eighteen months experience it was found that the Bureau of Venereal Diseases had followed a plan of work originally suggested and outlined by the Bureau of Venereal Dis-

eases of the United States Public Health Service, and which plan was conceived for cities and was suitable to a State with a large urban population, should be considerably reorganized in such a way as to make it reach more effectively our large rural population. The general plan of attack on venereal diseases as promulgated by the Federal authorities consisted largely in the maintenance of public dispensaries in cities of 10,000 population and over. Along with this dispensary plan of attack on venereal disease, an extensive educational campaign carried out through bulletins and special pamphlets, had been under way. Recognizing the inadequacy of the dispensary plan for reaching rural people the executive office succeeded in interesting and in gaining the coöperation and financial participation of the



American Social Hygiene Association and the Bureau of Venereal Diseases of the United States Public Health Service in an intensive educational plan for the rural sections of the State. The revised plan included the use of a large truck, electrically equipped, moving picture outfit, exceptionally entertaining and instructive films on venereal diseases and a competent corps of lecturers for reaching all the people, urban and rural, including the remote country districts. This effort is another pioneer undertaking, this being the first carefully considered attempt to reach in a large way the rural sections with the campaign against venereal diseases. At this time this work has been carried on in Cumberland, Harnett, and Robeson counties and many reports from those counties are convincing that this rural educational unit, organized as a part of the Bureau of Venereal Diseases, will prove a decidedly successful undertaking.

*Maintenance of Personnel*—The high cost of living, the depreciation of the purchasing power of the dollar, have made it very difficult during the past two years to maintain efficient men in salaried positions. This difficulty has been augmented by the fact that for the last six or eight years there has been a decreasing output by the medical colleges of medical graduates and the fees charged in medical practice have been advanced, the practice of medicine thereby having become more remunerative than heretofore. As a result of these economic conditions we lost from the executive staff within the last biennium the following officers who resigned their positions with us to accept positions of greater remuneration elsewhere: Dr. A. McRae Crouch, Mrs. Kate Brew Vaughn, Dr. Jas. A. Keiger, and Dr. A. J. Warren. In addition to the above resignations Dr. J. R. Gordon resigned as Director of Bureau of Vital Statistics on account of impaired health, and Dr. B. E. Wash-

burn, who was loaned by the International Health Board, was withdrawn for assignment to work in Jamaica. To fill these vacancies Dr. F. M. Register has succeeded Dr. Gordon as Director of the Bureau of Vital Statistics; Dr. J. S. Mitchener has succeeded Dr. Crouch as Director of the Bureau of Epidemiology; Miss Rose M. Ehrenfeld has replaced Mrs. Vaughan in charge of the Bureau of Public Health Nursing and Infant Hygiene; Dr. Millard Knowlton has taken over the work of Dr. Keiger as Director of the Bureau of Venereal Diseases, and Dr. K. E. Miller was detailed by the Public Health Service to assist the State in the development of its county health work and to replace Dr. Washburn. Mr. H. E. Miller, C.E., was appointed early in 1919 as Director of the Bureau of Engineering and Inspection. The significant fact in this statement of changes in personnel is this: that of seven bureaus represented in the general work of the Board there is now only one of the bureau directors, Dr. George M. Cooper, who has been with the Board as long as two years. It is respectfully submitted that any business with a labor turnover similar to that which the executive staff has sustained within the last two years would be in serious danger of bankruptcy. One of the most difficult results which the executive office is to be credited with has been to maintain a working staff under the conditions mentioned, and it may be said, without fear of contradiction, that notwithstanding these conditions, the present staff is as efficient as the staff has been at any past time, and will be better appreciated when compared with similar organizations in other states.

*Securing Valuable Outside Coöperation and Financial Assistance*—The executive office has succeeded in interesting and securing the financial participation, during the past two years, of the

International Health Board, the United States Public Health Service, the Interdepartmental Social Hygiene Board, the American Red Cross, and the American Social Hygiene Association. During this biennial period these agencies have contributed to health work in North Carolina a total of \$273,633.42, while the State expended a total of \$280,015.52—an expenditure from the co-operating agencies of dollar for dollar with the State.

*Participating in the Direction of the Larger Volunteer Health Movements*—During the past year the executive officer of the Board, as a recognition of the part that this State was taking in dealing with the public health problem, was elected President of the American Public Health Association. Any position with the opportunity for participating in and influencing national health movements which concern the State in many ways, especially through Federal legislation and channels of influence for reaching the masses of the people, is not without direct value to our people. As President of the American Public Health Association the executive officer of the Board has necessarily had to give a great deal of time to these larger outside interests; moreover, it could be easily shown if details were in order, that the time spent in this outside work is more than justified by benefits to the health work of our own State.

*The Educational Work of the Board.* The executive office assumes charge and directs the large educational activities of the Board of Health. During the year 1919 this work included the issuance of a 48,000 edition of the monthly HEALTH BULLETIN, the preparation, printing, and distribution of 375,380 pamphlets on special subjects. For the year 1920 the monthly edition of the BULLETIN of 48,000 copies was continued and 292,807 pamphlets on special subjects were supplied the peo-

ple. In addition to the above educational activities of the Board ..... pamphlets on social hygiene and venereal diseases were distributed in 1919 and in 1920 this class of educational material rose to ..... pamphlets. This piece of work, as has been suggested elsewhere, is the most important of all the work of the Board, for all else depends upon the interest and intelligent coöperation of the people with the public health officials, and such interest and coöperation is secured, at least 90 per cent of it, through the educational work of the executive office.

*Accounting*—During 1919 the executive office received \$198,549.14, 2,285 checks having been issued. During the last year these figures were: Total receipts from all sources, \$359,605.83, total number of checks written, 2,633. Funds are received from many sources, including the State Treasury, International Health Board, American Red Cross, United States Public Health Service, Interdepartmental Social Hygiene Board, Bureau of the Census, and some thirty or forty counties, and fees from sanitary inspectors of privies. An elaborate double entry system of books is necessary. In reporting upon a recent audit of the books a certified accountant, among other things says:

"I certify without hesitation that I do not believe there is a more complete set of books or a more efficient book-keeper in any State Department."

*Routine Work of the Office*—The executive office has handled an official correspondence during the last two years amounting to the receipt of 18,197 letters and 9,365 replies. This does not include 18,274 multigraph letters. In addition to this correspondence the executive officer spends 25 per cent of his time in conferences with persons coming to the Board on official business. The executive officer of the Board spent 79 days on official work out of the office in 1919, and 102 days out of the office in 1920.

## THE HEALTH BULLETIN

1919

## RECEIPTS

Balance from preceding year.....	\$ 8,211.45	
State appropriations .....	102,301.98	
Federal Government .....	27,084.95	
U. S. Public Health Service .....	741.47	
International Health Board .....	10,227.62	
Counties .....	38,480.42	
Bureau of the Census.....	3,531.57	
License Fees .....	5,338.21	
Miscellaneous .....	2,631.47	
Total.....		\$198,549.14

## DISTRIBUTION

Executive Department .....	\$ 40,262.39	
Bureau County Health Work .....	63,833.31	
Bureau Engineering and Inspection .....	9,521.74	
Bureau Epidemiology .....	18,811.01	
Bureau Infant Hygiene .....	6,608.73	
Bureau Medical Inspection of Schools .....	8,587.44	
Bureau Venereal Diseases .....	33,809.08	
Bureau Vital Statistics .....	17,115.44	
Total.....		\$198,549.14

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## RECEIPTS

State appropriations .....	\$177,713.61	
Federal Government .....	25,374.98	
U. S. Public Health Service .....	3,157.32	
International Health Board .....	18,346.15	
American Red Cross .....	4,792.48	
Counties .....	102,556.78	
Bureau of the Census .....	3,265.05	
License Fees .....	23,288.90	
Miscellaneous .....	1,110.56	
Total.....		\$359,605.83

## DISTRIBUTION

Executive Department .....	\$ 32,184.78	
Bureau County Health Work.....	150,155.03	
Bureau Engineering and Inspection.....	29,310.90	
Bureau Epidemiology .....	13,009.29	
Bureau Medical Inspection of Schools.....	60,702.18	
Bureau Public Health Nursing and Infant Hygiene.....	9,584.99	
Bureau Venereal Diseases .....	49,363.59	
Bureau Vital Statistics .....	15,295.07	
Total.....		\$359,605.83











